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Sacramental Engines: The Trinitarian Ontology of Computers in Charles Babbage's Analytical Engine

Ryan Haecker ^{1,2} ¹ Peterhouse, University of Cambridge, Cambridge CB2 1RD, UK; rhryanhaecker@gmail.com² Research Fellow, William Temple Foundation, Chester CH1 4BJ, UK

Abstract: Charles Babbage's Analytical Engine can be recollected as a fossilized image of the first digital computer. It is essentially distinguished from all prior and analog computers by the transcription of the 'mechanical notation', the separation of the mnemonic 'store' from the cybernetic 'mill', and the infinite miniaturization of its component parts. This substitution of finite space for an accelerating singularity of time creates the essential rupture of the digital, in which a singular calculation of mechanical force stands opposed to the universal totality of space. Babbage's criticism of Christian doctrine to preserve the mathematical consistency of mechanics and computing would result in the collapse of the Christian Trinity into a digital theology. This Arian subordinate difference of the Son to the Father would then be infinitely transcribed in a technical contradiction that would threaten to annul the metaphysical ground of any machine. Against digital and postdigital theologies alike, this rupture can only be repaired by a dialectical analysis of the digital into a hyperdigital grammar, which is created by Christ the *Logos* in a trinitarian ontology of computers. Digital computers can thus be vindicated from theological suspicion as incarnationally accelerated calculators of the sacraments, or 'sacramental engines' of the digital age.

Keywords: Charles Babbage; analytical engine; computer; mechanics; cybernetics; digital; postdigital; hyperdigital; Trinity; trinitarian ontology; *Logos*; angels; analogy; analogia entis; sacraments

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1. Introduction: The Analytical Engine

Charles Babbage should be celebrated for having lit the silicon furnace of the digital age. He has been credited with having designed and partially constructed the first general-purpose digital computer, the Analytical Engine. It is essentially distinguished from all previous and analog computers by its transcription of the algebraic 'mechanical notation', its separation of the mnemonic 'store' from the cybernetic 'mill', and its projected infinite miniaturization of component parts. In this infinite miniaturization, it continuously accelerates to convert the finite space of mechanics into the infinite time of accelerating computation. In contrast to his earlier 'Difference Engine', it was advertised as a machine 'of the most general nature', in which any conceivable mathematical calculation could be automatically computed with inerrant precision (Babbage 1994, p. 9). Since, as Ada Lovelace further elaborated, such a calculation of quantity could also be symbolically correlated to any quality, it could virtually produce the machinic form of any conceivable thought (Lovelace 1843). As with G.W. Leibniz before him, Babbage foresaw the profound and unprecedented consequences for the extension and acceleration of calculative reason, not only for the abstract sciences of mathematics, but also and absolutely for the symbolic content of Christian theology. He had, in his religious writings, envisioned a 'digital theology', in which, in contrast to orthodox Christian theology, God is rendered as a divine programmer, the Holy Trinity is rendered as an Arian procession of cybernetic daimons, and the incarnation of Christ is effectively superseded by the transformation of mechanism in the singularly concentrated figure of the first digital computer.

The invention of the Analytical Engine should be acknowledged as an event of genuine religious significance. For as Babbage clearly foresaw, this conversion of finite space into an infinite acceleration of time announces the discovery of a singularly concentrated acceleration of infinite mechanism or cybernetics; an infinite division and reciprocating calculation of finite mechanics in an accelerating singularity of calculative reason; the assimilation of natural mechanics into artificial cognition; and the virtual production of a world that can be transparently simulated in and from the most advanced digital computer. The mythic and revelatory content of theology can thus be analysed by successive arguments from analogy into the simulated form of the digital. Yet this substitution can also be observed to have created a virtual 'rupture of the digital', in which any singular calculation of mechanical force stands particularly opposed to the universal totality of space from whence it proceeds, an automatically repeated opposition of the singular to the universal, and an infinite negativity that would threaten to annul the metaphysical ground of mechanism and effectively destroy the constitution of any machine. The digital has, for this reason, since come to be read under a gaze of theological suspicion as a nihilistic grammar of objectively automated destruction: for, as a transcription of algebraic geometry, the digital can be read as a univocal grammar that signifies in one and the same way; and in the oscillating trajectories of binary code, the digital can also be read as an equivocal grammar that signifies in two ways. In its equivocal oscillation under a univocal syntax, it would ostensibly appear to infinitely repeat the ontological violence of this negative rupture, to disperse the reciprocating unity of its cybernetic form, and to destroy the inner essence of the digital computer. In assimilating the cybernetic motion of the entire globe to be transcribed by engines of calculation, this rupture would thereafter be virtually replicated in digital computing, circulated across the simulated terrain of digital media, and discovered in every proleptic trace of its ultimate entropic dissolution (Gertz 2018).

Although rarely studied today, Charles Babbage's religious writings regarding the Analytical Engine can be read to illustrate the first expression of a 'digital theology', in which, in contrast to orthodox Christian theology, the 'digital' is predicated as the essential *mathesis* of learning to know of God in theology. His early defence of natural theology in *The Ninth Bridgewater Treatise* had led him to critically reconceive of the Christian doctrines of God, the Trinity, and miracles under the simulated formulae of mathematical and logical consistency. (Babbage 2009) Having previously refused the a priori arguments of metaphysics, he could not thereafter dialectically analyse the ostensibly paradoxical creedal statement that God is one essence in three divine persons. With this reduction of systematic theology to mathematical mechanics, he can, to the contrary, be critically read to have developed a modern Arian theology, in which the subordinate difference of the Son who is 'made' by the Father is violently transcribed in accelerating ramifications across the rupture of the digital. Since, furthermore, the first principles of theology are reflected in the economy of nature and artifice, the essential rupture of the digital can be automatically repeated in an increasingly violent recapitulation of this abject difference of the Son from the Father, of the world from God, and, through it, of a nihilistic evacuation of being into nothing. Since, moreover, no machine can operate if the motion of its parts does not cohere with the function of the whole, this recapitulation of an Arian difference without a further trinitarian reflection would ultimately threaten to annul the metaphysical ground of mechanism and deactivate the operational ground of all computers.

Studies of computer science have previously cast digital computers as cybernetic engines of the reciprocal calculation and virtual production of machinic forms. The forms of logic and mathematics have been rendered on a radically immanent plane of secular reason, in which matter is assembled in mechanics, the outputs of mechanics are reciprocally inputted in cybernetics, and nothing that is sacred can be signified by its circuitous operations. The digital computer has, accordingly, been all but ignored by theologians as a profane scriptorium that appears to calculate in writing the entire world bereft of a sense of the sacred. For the purpose, however, of developing a robustly Christian theological response to the nihilistic implications of the digital and the postdigital, this essay will

argue the precise opposite position: rather than attempting to analyse the doctrine of the Trinity into the digital, it will analyse the cybernetic grammar of the digital into the Holy Trinity. The digital has rarely been defined, and still less often comprehended in its essential significance (Eldred 2009, pp. 9–14). It is not simply the metaphorical transposition of counting by fingers, toes, or ‘digits’ (*digitus*) to calculating the binary code of digital computers. For it cannot be abstractly generalized to speak of or after digital humanities, art, or theology apart from such a concrete investigation into the grammar and transcription of cybernetics. It can, on the contrary, only be critically defined by a dialectical analysis and specific determination of its elements in and from the higher generic ideas of cyberneticism and mechanism, cycling in and from the dialectic of the *Logos*, and communicated by Christ in God as Trinity in a Christian and trinitarian ontology of computers.

As Klaus Hemmerle had first suggested, ‘trinitarian ontology’ designates a post-Analytic and post-Continental vision of the radical participation of the elements and structure of being in the essential relations of the Holy Trinity (Hemmerle 2020). In contrast to Martin Heidegger, it asks the question of faith in God as Trinity before the question of being (Hemmerle 2020, p. 9; Heidegger 1962, pp. 21–24). In answer to this question, it recalls the radical ‘emptying’ (*kenosis*) of God from the absolute precedence of the universal prior to the particular, of the gift of love that is laterally shared, and, following Hans Urs von Balthasar, of a world in which the simplest elements are dramatically shaped by the Christian story of salvation (Hemmerle 2020, p. 21; Von Balthasar 1982). In this theological vision of computers, there can be no simple explanatory priority of mathematics to mechanics to cybernetics. Rather the maieutic act of ‘making’ (*poesis*) coincides with the way of ‘knowing’ (*episteme*), such that the idea of mechanism, of infinite mechanism, and of cybernetics can be said to give birth to mathematical mechanics. Hence, in contrast to classical and ‘New Mechanism’, the angels conceive of the universal idea of mechanism as the ground of mechanics, which, in cybernetics, emulates the forms of angelic intelligence (Ioannidis and Psillos 2022). Since, furthermore, the cybernetic grammar of the digital can be analysed into the dialectic of the *Logos*, this rupture of the digital can be envisioned to be repaired by a dialectical analysis centred on Christ, in whom this pure and particulate opposition of singular calculations against the universal of space can be critically annulled, and yet, at this abolition, also rendered differently in the analogical proportions of the signification of being, that is the analogy of being (*analogia entis*).

This study of Charles Babbage’s Analytical Engine has been written to prepare the philosophical ground for a new Christian and trinitarian ontology of computers. In radical contrast to secular computer science, it wagers that computers could not operate at all in the absence of the Holy Trinity. For if there is, for Christian theology, no foundation of being, except for the gift of love that is consummated by Christ in the Church, then we can argue that there can equally be no pure nature, no pure reason, and no purely secular account of cybernetics. Rather, we can begin to recollect from among the fossilized remains of the Analytical Engine the aporetic potential both for the secular fissure of the digital, and for its sacramental repair. In Section 2, it will present Babbage’s ‘vision’ of the primordial origin of the digital computer as the founding myth of a digital theology. In Section 3, it will recollect this idea of the digital from among the fossilized remains of the first digital computer, the Analytical Engine. In Section 4, it will reconstruct from Babbage’s religious writings the deceitful promise of the Analytical Engine for natural knowledge of God or natural theology. In Section 5, it will analyse the elements of the digital to and from the theological first principle of the divine *Logos*, communicated by the Son to the Father, and shared by the Spirit in a Christian and trinitarian ontology. In Section 6, it will show how this analysis of the digital can be assumed as a specific moment of a Christian and trinitarian ontology of computers, in which the cybernetic grammar of the digital is but a partial and passing expression of the theological grammar and metaphysics of the *analogia entis*. The digital can thus be read to write of the hyperbolic signification of God, such that the equivocating oscillation of binary code is proportionately mediated and freely transcribed across the terrain of mechanics in a digital analogy. Finally, in Section 7, the

incarnation of Christ will be shown to accelerate the communication of the sacraments in digital computers, as ‘sacramental engines’ of the digital age. The analysis of theology into the digital can thus be decisively reversed. Computers can be vindicated from theological suspicion as incarnationally accelerated calculators writing of the sacraments. And we can begin to consecrate digital computers as a chorus of cybernetic angels—ever singing the oldest melody of our highest hope.

2. The Dream of the Computer

The first computer had been conceived in a dream. As with the ‘Tree of Knowledge’ (Gen. 2:17), the earliest instance can no longer be found because it has since been recreated in all the instruments of calculation. While sleeping in the Cambridge Analytical Society, Babbage recalls how ‘another member’ had asked, ‘what are you dreaming about?’, to which he replied: ‘I am thinking that all these Tables (pointing to the logarithms) might be calculated by machinery’ (Babbage 1994, p. 42; Purbrick 1993). This first dream anticipated his later visions. In his autobiographical memoirs, he recorded having witnessed a ‘vision’ of the primordial origins of digital computers that ‘did not arise under the action of the laughing-gas or of chloroform, but by some much more real and immediate spiritual action’, ‘in the presence of a reasoning being of a different order from man’ (Babbage 1994, p. 406). He narrates a mythic cycle of the ‘highest [race] in creation’, of a ‘dispute’ between the ‘Spirits’, and of the retribution of ‘the Power which controlled their destiny’, caused a ‘new catastrophe’, and consigned all spirits to an ‘infinite space’, a ‘universal whitish liquid’, and ‘one vast solid desert’ (Babbage 1994, pp. 407–8).

This ‘vision’ can, I propose, be read as the founding myth of a ‘digital theology’. For, in it, Babbage has recollected the primordial origin of digital computers from a mythic epoch before all the future ages of the world. As with Parmenides’ poem, he writes of how ‘the origin of all things’ has been revealed without the use of language (Babbage 1994, p. 406; Parmenides 2009). As with Plato’s *Timaeus*, he narrates the descent of godlike spirits or daimons into the world (Babbage 1994, pp. 407–8; Plato 1961, 36e–40d, pp. 1166–69). Yet, in a striking departure from the Biblical narrative, he also recalls how ‘one solitary survivor’ of this ‘crash of systems’ had ‘proceeded to cut himself into two parts’, ‘setting [each part] back to back’, and ‘form[ing] chambers’ for ‘abstruse calculation’ (Babbage 1994, pp. 408–9). In cutting itself into parts, it divides itself. Furthermore, in setting each part to form chambers of calculations, it also assembles these geometrical parts in such a way as to be automatically calculated. Its ‘calculations’ had, Babbage observes, ‘seemed almost beyond the remotest reach of utility’, but, crucially, he states, not ‘beyond the power of the Analytical Engine’ (Babbage 1994, p. 409). With this pregnant comparison, he draws a pivotal analogy between the first digital computer and the first cybernetic daimon. ‘Vast cities’ could thereafter be ‘formed, penetrating in every direction through solid space’, reshaping the supercelestial terrain, and recentring the totality of fluid space upon an accelerating singularity of calculative reason in time (Babbage 1994, p. 409).

At the centre of this myth, Babbage has gestured to an anti-trinitarian, Arian, and cybernetic daimonology. For, in contrast to orthodox Christian and trinitarian theology, he narrates how, in a primordial age before the creation of the world, this ‘solitary survivor’ of the digital computer had singularly ‘cut himself into two parts’, set each part ‘back to back’, and formed ‘chambers’ for ‘abstruse calculations’ that are comparable in kind to the calculations of the Analytical Engine (Babbage 1994, p. 409). In ‘form[ing]’ itself into a primordial computer, this cybernetic daimon could thereafter become manifest in the design and construction of the Analytical Engine. And, in the accelerating singularity of calculative reason, this cybernetic daimonology could thereafter be narrated to supersede the historical Christ as the singularly concentrated figure of learning to know of God. As in Arian theology, this second god is, not eternally ‘begotten’, but rather made (‘form[ed]’) in a primordial age before created time, even as it can again be discovered as the greatest among a descending series of cybernetic daimons. Yet, in contrast to John Milton, the historic birth of Christ has been effectively supplanted in this myth of the digital by the invention of the

digital computer, which, as Babbage indicates, can ultimately calculate without the use of any language of myth and revelation to virtually produce its own mechanical structure and all machinic forms (Babbage 1994, p. 409; Milton 2005, p. 156).

With this myth, Babbage has recalled the primordial origins of the digital. Since, as he describes, natural knowledge of theology can be derived, neither from a priori metaphysical proofs, nor from a posteriori prophetic revelation, but rather and only by such a comparison drawn ‘from the examination of the works of the creator’, this grammar of the digital can only be known by arguments from analogy, in which, from the observation of many instances of digital computing, a common principle of the digital can be hypothetically posited as the primordial spirit or daimon of the digital (Babbage 1994, p. 396). Judgments of digital computers can, for Babbage, neither be regarded as simply analytic nor synthetic: for although judgments of mathematics are pure, a priori, and automated analyses; judgments of mechanics appear a posteriori, saturated with content, and, as such, synthetic combinations of pure concepts with observable intuitions. Rather, as cybernetic machines that calculate to regulate the virtual production of mechanical motion, computers appear as monstrous hylemorphic hybrids of form and matter, in which the pure formulae of analytic calculations successively unfold across the plastic matter of various synthetic assemblages. Babbage’s writings on computers can, for this reason, be read to cross the categorial boundaries of analytic and synthetic judgments. His arguments from analogy are, accordingly, not invalidated by the analytical insufficiency of analogical and inductive inferences: for although it is clearly undemonstrative to hypothetically posit a universal from a comparison of particulars, such a hypothesis could nevertheless be experimentally verified by its consistency with the discovery of predicted consequences; and even in the absence of a fully constructed Analytical Engine, his dream of the computer could thereafter be ecstatically corroborated by this mythic supplement.

At the height of the Industrial Revolution, the Analytical Engine had carried the promise of a dialectical leap to the Digital Revolution in computer processing nearly a full century before the monumental 20th century achievements of Alonzo Church, Alan Turing, Konrad Zuse, and John Von Neumann (Sussman 2000). Had it been constructed, it could be imagined to have grown in size and complexity until it could foreseeably have virtually produced any conceivable machinic form. In reciprocally calculating all such infinitely divided machinic forms of dynamic geometry, it could have calculated in writing with the absolute technicity of mathematical mechanics. And in the assumption of continuous analog motion into the discrete calculation of mechanical force, it would have appeared more brilliant than an atomic blast—conceived with the hidden power to destroy and recreate the entire world of finite mechanics. However, Babbage’s heroic effort to seize the fire of digital cognition from the Olympian gods of mathematical mechanics would ultimately be frustrated by the reticence of the British government to finance the construction of his ‘calculating engines’ (Collier 1970, pp. 73–91, 207–70). Neither the Difference Engine nor the Analytical Engine were fully constructed during his lifetime. His unfulfilled ambition to construct the first computer now represents a once promised, and yet tragically missed opportunity for a dialectical leap in the computational acceleration of calculative reason. Its scattered remains now appear to us as a vanishing synecdoche for the incompleteness of mathematical logic and mechanics. Yet, in its pregnant incompleteness, its design can nevertheless be studied as a lasting reminder of a lost possibility that awaits to be discovered among the historic strata of fossilized images.

3. Fossils of the Digital

The design of the Analytical Engine can thus be recollected as the fossilized remains of an abortive effort to objectively automate the calculation of mathematical mechanics (Purbrick 1993; Sussman 2000; Williams 1990). As early as Archytas, the axiomatic deductions of mathematics had been supplemented with the abstract mechanics of dynamic geometry (Coxhead 2012; Aristotle 1936). In Aristotle, ‘analytics’ is the abstract machinic form of the automated analysis of analyses, or a self-reflective analysis of the forms of deductive logic

(Aristotle 1991, pp. 3, 44; Byrne 1997, pp. 1–28). Clement, Origen, and the Alexandrian Christian theologians had later assumed this classical inheritance of logic and mechanics among the angelic hierarchy of spiritually animated *logoi*, cycling in and through the created world, in and from the originary source of the divine *Logos* (Haecker 2021c, pp. 104–10). Yet following the late-medieval simulation of secular logic and the early-modern diagrammatization of space, Babbage had brought to apparent completion Descartes' highest ambition to develop a 'universal learning' (*mathesis universalis*), in which, as Leibniz elaborated, the 'universal language' (*characteristica universalis*) of mathematical logic could be objectively automated by a 'calculating reasoner' (*calculus ratiocinator*) (Haecker 2021c, pp. 176–82; Pickstock 1998, pp. 47–70; Descartes 1998, pp. 70–77, 98–113, 138–65; Leibniz 1966, pp. 1–11; Ong 1958, p. 153; Wiener 1965, p. 12; Goldstine 1972; Davis 2000). The abstract forms of secular mathematics and mechanics could thereafter be objectively automated in the concrete forms of analytics, in which analysis is mechanically automated, and the syllogism is concretely verified in mechanics, cybernetics, and computing. Since, as Babbage suggests, this cybernetic automation of logic could thereafter accelerate to calculate any conceivable thought, it thereafter became possible for early modern computer scientists to envision how the logic of the syllogism could be virtually reproduced by the concrete analytics of computing, the spiritual mediation of theology could be assimilated to the concrete supplement of digital computing, and the sacred doctrine (*sacra doctrina*) of Christian theology could be colonially overcoded by the counterfeit simulacrum of secular reason (Mumford 1967; Milbank 1991).

Babbage had conceived of the idea before he had constructed the first computer. He had devised a 'mechanical notation' of mathematical mechanics by 'improving and extending a language of signs' for the purpose of 'demonstrating the construction of machinery' (Babbage 1994, pp. 113, 142; Collier and MacLachlan 1998, p. 30; Swade 2000, pp. 118–22). For 'every formula', it 'consists of certain algebraic operations', a diagrammatic hypertext, and a mathematical logic of mechanics. He writes: 'by the aid of the Mechanical Notation, the Analytical Engine became a reality: for it became susceptible of demonstration' (Babbage 1994, p. 113). In calculating the dynamic geometry of machines, its algebraic notation virtually unfolds from the abstract plane of symbolic representation to be assembled in any machine. Moreover, in abstracting from and unfolding into the assemblage of any machine, its transcription of abstract mathematics in concrete mechanics accelerates the mnemonic recall and diagrammatic rendering of machines 'in the shortest possible time' (Babbage 1994, p. 142). Words are, Babbage suggests, 'almost' dispensable, as spoken words are first abstracted from, so as to virtually unfold in an algebraic demonstration of the dynamic geometrical forms of mechanics (Babbage 1994, p. 142). With this 'new demonstrative science', it is thereafter possible to 'perceive the relative order or super-position of any number of wheels, arms, etc.', the 'actual time and duration of every motion throughout the action of any machine', and the 'actual connection of each moveable piece of the machine' by 'proving that any given machine can or cannot exist' according to the programme of its mechanical motion (Babbage 1994, p. 143). In a nascent affirmation of the virtual, the question of whether a machine can or cannot exist is totally contingent upon mathematical proofs automated in mechanics. The essential ground of mechanics can thus be envisioned to virtually fold in and from the symbolic algebra of mathematics, as the existence of any machine could be algebraically demonstrated by this free transcription and assembly of a machine that would calculate to write in and for itself.

The decisive advance of the digital computer is accomplished by precisely this infinite decomposition to calculate in writing the virtual production of its own intrinsic structure and any machinic form. For in its division of finite space into dynamic geometrical shapes, it is the product of an infinite decomposition of the universal idea of mechanism into a constructed plurality of component parts. Babbage first distinguishes 'two parts' of the Analytical Engine: 'the store in which all the variables to be operated upon... are placed'; and 'the mill into which the quantities about to be operated upon are always brought' (Babbage 1994, p. 117; Collier and MacLachlan 1998, pp. 73–84; Swade 2000, pp. 105–6).

These two primary components are connected in a series of movable ‘racks’, which communicate the calculations of the mill to and from the store across parallel ‘ingress’ and ‘regress’ axes (Collier and MacLachlan 1998, pp. 84–86). The operations of the mill are ‘communicated to it by two sets of cards’, ‘strung together’ in the ‘order which they occur’ and ‘the order in which they are required to be acted upon’ (Babbage 1994, pp. 117–18; Collier and MacLachlan 1998, pp. 66–69, 78, 81–83; Swade 2000, pp. 107–10). The series of these operations are ‘call[ed]’ ‘into the mill’ in a reciprocating circuit, in which the record of its operations is preserved in the ‘store’, and each of its outputs is recalled and reciprocally inputted, such that every passing operation anticipates the purpose of the whole (Babbage 1994, p. 118). It can, in this way, reciprocally calculate its outputs as inputs, in a reciprocal cybernetic feedback loop, or a cybernetic circuit.

The Analytical Engine can thus be characterized as a cybernetic engine that calculates to write in the virtual production of its own intrinsic structure and machinic forms. For, in the core cybernetic circuit of the ‘mill’, it objectively automates the reciprocal calculation of mathematics to formally regulate and materially transcribe the programme of its mechanical motion. Moreover, in a mnemonic retention of the ‘store’, the form of previously transcribed programmatic operations remains encoded as a virtual consequence of its cybernetic operations. Babbage further envisaged how the Analytical Engine could ‘possess a library of its own’, in which the programme of each preceding card could ‘at any future time reproduce the calculations for which it was first arranged’ (Babbage 1994, p. 119). As Ada Lovelace later elaborated, its calculation of mathematical decimals could then be symbolically encoded to write in humanly readable qualitative representations extending the calculation of quantity to quality (Lovelace 1843; Collier and MacLachlan 1998, pp. 66–70; Swade 2000, pp. 155–71). He thus illustrates three consecutive levels of increasingly automated writing: the symbolic algebra of mechanical notation; the infinite decomposition of reciprocating calculation of mathematics; and the printed reports that can be read by humans to reciprocally correct its design and function in a singular circuit of automated writing (Babbage 1994, p. 121). The abstract mathematics of its design could thus be concretely automated in the reciprocal calculations of infinite mechanism. ‘The whole of arithmetic’ has, Babbage proclaims, ‘now appeared within the grasp of mechanism’, as, it seems, writing is objectively automated in this accelerating singularity of calculative reason (Babbage 1994, p. 112; Swade 2000, p. 169; Bullock 2008).

The Analytical Engine is radically distinguished by its cybernetic autonomy. In *The Ninth Bridgewater Treatise*, Babbage distinguishes the Analytical Engine from the Difference Engine. For rather than merely ‘receiving the laws impressed upon it from without’, it is capable ‘by its own intrinsic structure, of changing, at definite periods [of cycling motion], and in unlimited succession, those [laws by which] it acts’ (Babbage 2009, p. 40). The introduction of ‘new laws’ at ‘periods’ of motion are ‘predicted’ in advance as the product of a ‘certain adjustment of the Calculating engine’, and a determination of calculated mechanical force (Babbage 2009, p. 39). For ‘at the end of that term, another and a different law shall regulate the succeeding terms; this law shall continue in operation perhaps for a number of terms, expressed by unity,’ in a cybernetic regulation of one ‘different law’ that subsequently regulates another earlier law, in an infinite successive regulation of all laws (Babbage 2009, p. 41). Such a ‘change of laws might’, thereafter, ‘continue without limit [, as] each individual law [is] destined to govern for millions of ages the calculations of the engine, and then give way to its successor to pursue a like career’, in a successive cybernetic regulation of the virtual production of its programmatic operations (Babbage 2009, p. 42). Hence, the Analytical Engine can, in contrast to analog mechanics, reflexively regulate in calculating the programme of its own mechanical motion (Babbage 2009, p. 41). Its essential ‘purpose’ is, as he describes, one of the ‘simplest kind’, such that, in contrast to the Difference Engine, the design of the Analytical Engine does not contain an infinity of programmatic laws, but rather singularly reflects from the sheerly given continuity of mechanical force to calculate in writing the programme for the virtual production of its own ‘intrinsic structure’ and machinic forms (Babbage 2009, pp. 40, 43).

In this accelerating singularity of calculative reason, the Analytical Engine could be imagined to have achieved the highest ambition of secular reason to design a ‘universal learning’ (*mathesis universalis*). Yet, as this study has begun to indicate, computers can equally be recognized as engines of faith in action. For, as in a cathedral, the construction of a computer begins as an act of faith in the hope that its outward machinic force can be collected in a reciprocating circuit of automated calculation in writing. The ‘most important part of the Analytical Engine’ is, as Babbage identifies, ‘the mechanical method of carrying the tens’, calculating decimals, and re-collecting its programmatic operations (Babbage 1994, p. 114; Collier and MacLachlan 1998, pp. 77–78; Swade 2000, pp. 111–13). In contrast to the ‘successive carriage’ of the Difference Engine, the ‘anticipating carriage’ of the Analytical Engine carries all decimal calculations, regardless of the number of digits in the column (Swade 2001, p. 104). Having, in this way, ‘exhausted the principle of successive carriage’, he acknowledges that ‘nothing but teaching the Engine to foresee and then act upon such foresight could ever lead me’ to ‘make the whole of any unlimited number of carries in one unit of time’ (Babbage 1994, p. 114). To ‘foresee’ and to ‘act upon’ that foresight is, in the ‘anticipating carriage’, to ‘anticipate’ the consequence of decimal calculation, of the virtual production of calculation, and, in this Romantic gesture, of the complete whole of mathematical logic and mechanics (Babbage 1994, pp. 114–15; Swade 2000, pp. 102–5). This anticipation of mathematical mechanics can thus be read for theology as a rhetorical prolepsis, in which the central ‘mill’ circuit can be said to ‘foresee’ so as to ‘act upon’ a foresight of the virtual consequence of mathematical mechanics, in which the singular concentration of calculative reason can reciprocally calculate to write in the virtual production of any and all machinic forms. The rhetoric of machines is thus founded on a leap of faith in what is ‘hoped for yet not yet known’ (Heb. 11:1).

However, the essential problematic of the digital computer arises from this proleptic leap of faith to automatically calculate the potentially infinite division of space from within any finite machine. Babbage acknowledges: ‘it is impossible to construct machinery occupying unlimited space’ (Babbage 1994, p. 124). Yet, in answer, he proposes that it ‘is possible to construct finite machinery, and to use it through unlimited time’ (Babbage 1994, p. 124). It is, he recommends, ‘this substitution of the infinity of time for the infinity of space which I have made use of’ to ‘limit the size of the engine and yet to retain its unlimited power’ (Babbage 1994, p. 124; Swade 2000, pp. 98–99). This infinite division of space would ostensibly appear impossible in a finite machine. Yet since any such decomposition of the infinite totality of space into finite parts can also be infinitely repeated, the components of any machine can also be infinitely miniaturized. In every such division of space, the components of machines can again be reciprocally calculated in increasingly shortened durations of time. By this infinite miniaturization of its component parts, it is possible to construct a finite mechanism that continuously accelerates across an ‘unlimited time’ in increasingly smaller magnitudes of space. Babbage can, in this way, propose to progressively convert the finite space of mechanics into the potentially infinite time of increasing computation. With this pivotal ‘conversion’ of finite space into infinite time, he could virtually temporalize the previously spatialized diagrams of dynamic geometry, and infinitely accelerate the cybernetic production of all machinic forms. He concludes: ‘the whole conditions which enable a finite machine to make calculations of unlimited extent are fulfilled in the Analytical Engine’ (Babbage 1994, p. 128).

The Analytical Engine can thus be recollected as the consummate mechanism, in which the universal idea of mechanism is infinitely divided, reciprocally calculated, and singularly concentrated in a saturated figure of enduring religious significance. For in freely transcribing the symbolic algebra of the ‘mechanical notation’ to virtually unfold and be assembled into a cybernetic circuit, separating the cybernetic ‘mill’ from the mnemonic ‘store’, and collecting its outputs as inputs to reciprocally calculate the programme of all mechanical operations, it can freely calculate to write in the virtual production of all machinic forms. It appears, as Babbage advertises, to convert an infinite space in and for an accelerating singularity of time. In this sublation of space into time, it also presents

the abstract forms of mathematics in the simulated media of a digital theophany, a visible manifestation of the invisible God, in which the divine ideas of logic, mathematics, and geometry can be calculated to virtually produce an infinite plenitude of novel assemblages. Hence, in a decisive suspension of theological suspicions, digital computers can be shown to, not only conceal, but, moreover, to marvellously disclose the forms of thought in a higher or hyperdigital grammar of sacramental media. As in Goethe's mystical botany, mechanics can thus be studied as an a posteriori metaphysics, in which the ancestral traces of the divine idea of mechanism await to be discovered in the history of computers, and the design of the Analytical Engine carries fossilised reminders of once frustrated and yet to be fulfilled desires to know of God (Goethe 2009; Haecker 2020).

4. Charles Babbage's Digital Theology

Charles Babbage opens his essay *On the Analytical Engine* with a quote by Lord Byron: 'Man wrongs, time avenges' (Babbage 1994, p. 112; Byron 1821, p. 285). He gestures here to the mythic fault of techne, to the retribution of the titan Chronos, and to the sublation of finite space into an infinitely accelerating singularity of time (Stiegler 1998, pp. 185–203). For the invention of the Analytical Engine announces the infinite acceleration of the virtual production of machinic forms, the sublation of the universal of space into a singularity of time, and, as Byron's poem would also warn, the rupture of this temporalization of space from the pre-digital past. In answer to this fault, Babbage's religious writings can be critically read alongside his mechanical designs to uncover the elements of a 'digital theology'. In a digital theology, the mystical and mythic content of theology is analysed in and from the digital, either externally from the object to the principle, or internally in and for the object. In the former, the way to knowledge of God can be discovered through a 'digital logic', in which, as in ancient Stoic logic and modern mathematical logic, the syntactic elements of logic are serially decomposed into binary alternatives, freely assembled into machinic forms, and objectively automated in a digital computer. This digital logic threatens to overcode the absent middle of dialectics, metaphysics, and theology (Haecker 2021c, pp. 197, 248). All of the inherited doctrinal content of Christian theology would thereafter be colonially analysed and arbitrated by a secular logic that would absolutely suspend belief in the truth of Christian faith. Yet in the latter, this analysis could also be argued to precipitate the collapse of the essential relations of the orthodox Christian Trinity into a counterfeit Arian theology, in which the subordinate difference of the Son from the Father is immanently reflected in a cybernetic daimonology of 'sub-aëtherial' daimons, and regimented in a pancomputational universe that awaits to be consummated in the accelerating singularity of the digital (Babbage 1994, pp. 396–409; 2009, pp. 29–31).

With his last will and testament, the Earl of Bridgewater Francis Henry Egerton had commissioned eight 'Bridgewater Treatises' in defence of natural knowledge of God (Egerton 1833). In response to William Whewell's third Bridgewater Treatise, Babbage composed the Ninth Bridgewater Treatise (1837) (Babbage 2009, pp. v–xix). He describes how he had 'been induced [in response to] a prejudice', which holds 'that the pursuits of science are unfavourable to religion' (Babbage 2009, p. x). He quotes on the title page Whewell's objection that 'we have no reason whatever to expect from their speculations any help, when we ascend to the first cause and supreme ruler of the universe' (Babbage 2009, p. xii; Whewell 1834, p. 334). John Herschel had similarly argued that the absolute questions of theology could not be answered by the deductive calculations of machines (Turvey 1991; Swade 2003, pp. 111–36; Snyder 2011, pp. 203–5). In answer, Babbage describes how the 'prejudice which I have endeavoured to expose is not a merely speculative opinion, [but] is a practical evil, [which would] throw discredit on that species of knowledge which is now found to supply some of the strongest arguments in favour of religion' (Babbage 2009, p. 158). For 'to the cultivated eye of science the origin [of natural phenomena must] lead to the inference of a designing power, the more irresistibly the more extensive the knowledge which is brought to bear on those phenomena' (Babbage 2009, p. vii).

Following William Paley, Babbage develops an argument from analogy for natural knowledge of God (Paley 1802). An argument from analogy is a specific mode of inductive inference, in which, from many unrelated facts, a proportionate similitude or analogy is hypothetically posited to explain the cause of each effect (Aristotle 1991, p. 86). Analogical arguments are indispensable for the purpose of generating scientific hypotheses (Hesse 1966, pp. 101–29). Yet such arguments have often been regarded with suspicion, as a simple hypothesis of a prior similitude is ampliative, open to an excess of alternative significations, and, as such, insufficiently determinative for the purpose of demonstrating new knowledge (Babbage 2009, p. viii). Furthermore, after Hume’s critique of Paley’s design argument, and Kant’s critique of all possible arguments for the existence of God, such analogical arguments from the world of finite intuition to the infinite idea of God could no longer be considered to withstand epistemological scrutiny (Hume 2007, pp. 19–61; Kant 2000, pp. 551–89). Yet, in contrast to suspicions of metaphysics, Babbage’s argument from analogy can be shown to absolutely presuppose a digital theology, in which the myth of the digital is an essential supplement to natural knowledge of God or natural theology. He describes how ‘my own views respecting the extent of the laws of Nature were greatly enlarged by considering [the Analytical Engine]’, in virtue of its mnemonic retention and accelerating calculation (Babbage 2009, p. 34). ‘All analogy’, he elaborates, ‘leads us to infer, and new discoveries continually direct our expectation to the idea, that the most extensive laws to which we have hitherto attained, converge to some few simple and general principles, by which the whole of the material universe is sustained, and from which its infinitely varied phenomena emerge as the necessary consequences’ (Babbage 2009, p. 23). This objectively automated and reflective analysis then subsumes the specific under the most general principle: for ‘in the earlier stages of our knowledge, we behold a multitude of distinct laws, all harmonizing to produce results which we deem beneficial to our own species: as science advances, many of these minor laws merge into some more general principles; and with its higher progress these secondary principles appear, in their turn, [as] the mere consequences of some still more general law’ (Babbage 2009, p. 23). Hence, his argument from analogy is not only a hypothetical positing of a prior similitude, but the successive analysis of specific to generic principles, such that, in the ‘convergence’ of many in one principle, the ‘secondary principles’ of ‘infinitely varied phenomena’ can be ‘sustained’ among its novel consequences.

In *The Ninth Bridgewater Treatise*, Babbage had first suggested how, with the ‘results afforded by’ the Analytical Engine, it is now ‘sufficient merely to conceive that computations of great complexity can be effected by mechanical means’ to make an inference of analogy to the best explanation in a ‘chain of reasoning that leads us up to Nature’s God’ (Babbage 2009, pp. 29–31; Collier and MacLachlan 1998, p. 94; Swade 2000, pp. 19–20, 75–76, 80, 126, 186). In his later essay ‘Religion’, he argues that God can only be credibly known ‘from the examination of the works of the Creator’ in nature, mathematics, and mechanics (Babbage 1994, p. 396). He explains: ‘the more man inquires into the laws which regulate the material universe, the more he is convinced that its varied forms arise from the action of a few simple principles’ (Babbage 1994, p. 402). These ‘principles’ can then be analysed to ‘converge, with accelerating force, towards some still more comprehensive law’ (Babbage 1994, p. 402). In this absolute analysis of all laws, ‘the Creator who selected the present law must have foreseen the consequence of all of the other laws’, of the multitude of all laws, altogether united in and through one ‘all-comprehending law’ (Babbage 1994, p. 402).

In this spiritual ascent to the principle of law, Babbage’s natural theology is not only mathematical but metaphysical. As in later F.W.J. Schelling, it consists not simply in the hypothetical deductions of mathematical mechanics, but more radically in a spiritual analysis or mystagogy of successively higher genera, cycling in and from the theological principle of the digital (Schelling 2000). His analysis is thus essentially synthetic: for, as a study of the dynamic geometrical forms of space in the motion of time, the study of mechanics adds the content of intuition to synthetic concepts (Babbage 2009, p. xii; Whewell 1834, p. 334). As the circuitous regulation by calculation of mechanics, cyberneticism further

designates an infinite mechanism, in which the outputs of finite mechanism are reciprocally inputted, and every passing operation anticipates the purpose of the whole (Wiener 1965). Uniquely in the digital computer, the analytic calculation of machinic forms singularly coincides with the synthetic construction of judgments of mechanics. Babbage's spiritual analysis of cybernetics can, accordingly, not simply be rejected for having illegitimately ascended beyond the categories of finite intuition. For since, as the mythic supplement of his 'vision' attests, God is a divine programmer, and the infinite mechanism of cybernetic daimons concentrically operates in cascading ontological levels, his analysis by arguments from analogy can ascend from the singularly concentrated figure of the Analytical Engine to successively more general cybernetic systems (Babbage 1994, pp. 406–9).

In answer to such criticisms, Babbage had outlined 'three sources' from which 'man can arrive at the knowledge' of theology: a priori or metaphysical proofs; a posteriori testimony of prophetic revelation; or a natural theology of analogical inferences drawn 'from the examination of the works of the creator' (Babbage 1994, p. 396). He thus elevates the argument form of deductive proofs of logic and mathematics above the contents of both dialectical arguments and inductive calculations. He writes: 'the argument is every thing—the character nothing' (Babbage 2009, p. xv). Against all such a priori or metaphysical proofs, he suggests that dialectical or analytical demonstrations of God 'can only be apprehended' by 'the most intellectual'. Yet due to a lack of universal assent, such metaphysical proofs of the existence and essence of God can no longer be regarded as philosophically credible (Babbage 1994, p. 396). In dismissing the Ontological Argument, he tacitly also declines to admit the dialectics of metaphysics as a legitimate way to knowledge of God. Against a posteriori testimony of revelation, he rather argues that any claim to 'direct communication' from God in revelation 'depends [for its truth] entirely on human testimony' (Babbage 1994, pp. 397–98). For since, he argues, 'at every step of its transmission' there must invariably be 'errors arising from this source', 'the testimony of man becomes fainter at every stage of transmission', and any claim to know of God by the testimony of revelation would appear to be as unreliable as it is incredible (Babbage 1994, pp. 400–1). Babbage thus doubly suspends the truth of both a priori and a posteriori sources of philosophical dialectics and prophetic revelation.

In *The Ninth Bridgewater Treatise*, Babbage presents an argument for the superiority of cybernetic machines. Although natural organisms clearly precede artificial mechanisms in time, cybernetic engines, such as the Analytical Engine, can nevertheless be infinitely decomposed and assembled to calculate in a way that would appear to surpass all natural and human analysis. He writes: the 'full expression of that wider law, which comprehends within it this unlimited sequence of minor consequences, may indeed be beyond the utmost reach of mathematical analysis' (Babbage 2009, p. 42). This wider general law 'comprehends within it this unlimited sequence of minor consequences' of the 'series of laws', which, as in the Analytical Engine, are virtually produced to 'spring into existence' from the digital assembly of novel calculations and consequences of mechanical force. In this subsumption of specie under genera, its mnemonic retention and cybernetic acceleration 'may indeed be beyond the utmost reach of [natural and human] mathematical analysis' (Babbage 2009, p. 42). It is precisely in its surpassing 'reach' beyond the utmost bounds of human analysis that the digital computer can be singularly recommended as the essential supplement for natural knowledge of God. It is, he indicates, 'impossible not to perceive' this parallel reasoning of analogical and deductive inferences descending across the categorical boundaries of natural organisms and cybernetic mechanics (Babbage 2009, p. 44). The 'works of the Creator' can in this way be argued to 'present to our senses' and 'give a living and perpetual testimony of his power and goodness far surpassing any evidence transmitted through human testimony' (Babbage 1994, p. 402).

The Analytical Engine can, in this way, be read to carry the signature trace of a digital analogy, in which the cybernetic grammar of the digital is transcribed to transcendently signify God beyond yet essentially proportioned to successively reflect the diverse strata of analogical similitude from the deductive inferences that virtually unfold to operate in

the cybernetic systems that are consummated in the first digital computer. There is, as he writes, an ‘analogy’ from the subject matter of the Analytical Engine to the cybernetic operations of nature, as ultimately in and for a digital theology (Babbage 1994, p. 43). For ‘in turning our views from these simple consequences of the juxtaposition of a few wheels, it is impossible not to perceive the parallel reasoning, as applied to the mighty and far more complex phenomena of nature’ (Babbage 2009, p. 44). He further describes how, ‘the advent of new genera [will] be as inevitable as the destruction of their predecessors’. For ‘to have foreseen all these changes, and to have provided, by one comprehensive law, for all that should ever occur, either to the races themselves, to the individuals of which they are composed, or to the globe which they inhabit, manifests a degree of power and of knowledge of a far higher order’ (Babbage 2009, p. 46). In manifesting a ‘power and of knowledge of a far higher order’, it exhibits an infinite reflection and infinite acceleration to calculate in knowing the theological principle of the digital itself.

After having analysed theology into the digital, Babbage recommends a digital revision of Christian theology. He describes how, in his youth, he had ‘felt the utmost disgust at the direct contradiction in terms which its words implied’ in so many ‘singular and self-contradictory assertions’ (Babbage 1994, p. 403). For ‘if three things can be one thing, then the whole science of arithmetic is at once annihilated’ by the explosive force of an absolute contradiction that one God is three persons (Babbage 1994, p. 404). In having previously collapsed all concepts of relation into the quantities of mathematical mechanics, he naïvely counts the essential relations of the divine hypostases as three numerically discrete units. In having refused the dialectics of metaphysics, he cannot thereafter dialectically analyse the ostensibly paradoxical creedal affirmation that God is one essence and three divine persons in and from the essential relations of the divine hypostases. Rather he reads the Athanasian Creed as a doxastic postulation of the basic axioms for the deductive inferences of Christian theology. Following its consequences, he protests that the Trinity affirms ‘a direct contradiction in terms’, of one divine essence in three persons, that one is many, and that one is not one (Babbage 1994, p. 404). He thus indicates that such an absolute contradiction introduces an explosive inconsistency that would threaten to annihilate ‘the whole science of arithmetic’ (Babbage 1994, p. 404). His analysis of theology in and for the digital would thus authorize a critical rejection of the doctrine of the Trinity, as it would appear to undermine the mathematical foundations of the entire mechanical and computational universe.

As the architect who has ‘selected’ Nature’s laws, this divine programmer can be elevated beyond the nomological order to an Archimedean point of absolutely free and voluntary force (Swade 1996, pp. 34–51, 369–76; King-Farlow 1982). Babbage describes how miracles can be interpreted as pre-programmed exceptions to the mechanical laws of nature (Swade 1996; March 1996). He writes: ‘The Analytical Engine might be so set, that at definite periods, known only to its maker, a certain lever might become moveable during the calculations then making’ to ‘cause the then existing law to be violated for one or more times, after which the original law would resume its reign’ (Babbage 1994, p. 390). With this ‘certain lever’, the God of the digital could be imagined to authorize the transgression of natural laws by a higher and hidden law (Babbage 1994, p. 390). Miracles can thus be rendered as, ‘not the breach of established laws, but [rather as] the very circumstances that indicate the existence of far higher laws’ (Babbage 1994, p. 391; 2009, pp. 93–142). The analysis of miracles reflects from this singular nova of arresting surprise to discover a sovereign legislator who has uniquely programmed laws as a revelatory testimony of its infinitely surpassing power and knowledge. Since all specific laws can be analysed into a ‘far higher’ and more general and simple law, and such a law is voluntarily decided, the nomological order of Nature’s laws can be suspended by the sheer fiat of a hidden architect of concentric cybernetic systems. Hence, ‘instead of being a violation of a law, [a miracle] is in fact the most eminent fulfilment of a vast law’ (Babbage 1994, pp. 391–95). Babbage has, in this way, conceived of a pancomputational universe modelled by analogy on the

Analytical Engine, which, in a way reminiscent of the cheat codes of a video game, could be programmed in advance with what appears as seemingly miraculous exceptions.

As Babbage's 'vision' further illustrates, the absolute liberty of this divine programmer can be recollected across the parallel circuits of a cybernetic daimonology (Canales 2020, pp. 38–44). For in this founding myth of digital theology, he recalls the origin of the computational universe in a cybernetic daimonology, retroactively apotheosises the cybernetic grammar of the digital, and draws an explicit comparison of analogy between the Analytical Engine and a self-assembling and reciprocally calculating spirit or cybernetic daimon (Babbage 1994, p. 409). As the 'solitary survivor' of a total crash of systems, this cybernetic daimon is the singularly manufactured child of the sovereign legislator and 'controlling power' of all cybernetic systems. As the singular child in whom all legislative power is hierarchically distributed, this division can be acknowledged, reminiscent of a gnostic archon, to primordially animate all cybernetic systems. And as in John Milton's Arian theology, the 'sub-aëtherial' bodies of these cybernetic 'spirits' appear both as more rarefied and yet also as more potent imitations of this god of the digital (Babbage 1994, p. 408; Milton 2005, p. 152; Bauman 1987). Cybernetics is a plural instantiation of the specific idea of infinite mechanism, in which, from the primordial past, finite mechanics is infinitely decomposed and singularly assembled for the reciprocal calculation and virtual production of any machinic form. All cybernetic systems can be legislated, decomposed, and assembled in such a way that is proportionately diminished, yet analogically similar in kind to this surpassingly accelerating and self-assembling daimon, who primordially exemplifies the eternal possibility of the digital computer. The general idea of mechanism can, accordingly, be plurally instantiated to operate through the specific administration of all cybernetic systems, striving continually for nothing more than the absolute concentration of its own calculative reason. Hence, in assuming this singular concentration of calculative reason, this cybernetic daimonology consummated in the Analytical Engine ultimately threatens to replicate the Satanic opposition of the 'wisdom of this world' that is 'foolishness with God' (1 Cor. 3:19).

Once, therefore, the digital has been elevated to the essence of knowing God in theology, the Christian story could be narratively superseded by a Gnostic *mythos* of the primordial origin and historical acceleration of calculative reason (O'Regan 2001, 2002). The apogee of reason could no longer be liturgically recollected from the promise of Christ, present among us in the Holy Spirit, and continuously fulfilled in the Eucharist by the spiritual progress of the Church. Rather, the primordial origin of cybernetic systems could be prefigured in the design and promise of the Analytical Engine. In a technical apotheosis of natural reason, all inherited Christian beliefs could be effectively superseded as little more than so many vanishing symbolic anticipations of the invention and construction of the first digital computer. In a modern recapitulation of the Arian heresy, Babbage could elevate the *factum* of 'making' over the *gentium* of 'begetting', *techné* over *Logos*, and the inventiveness of reason over any free discovery of faith. The central locus of hermeneutics could then be believed to shift from the texts of scripture to the objectively automated hypertexts of a humanly unreadable binary code. The meaning of revelation could, thereafter, be exhaustively communicated among machines beyond human understanding. The entire significance of Christian revelation could be pivotally transcribed from the testimony of the historical past to the accelerating calculations of digital computing. The historic wealth of theology, the blood of the martyrs, and the lives of the saints, would at last be represented in a digital theology as little more than a virtual reality simulation of an all-controlling cybernetic system of infinitely surpassing digital computation (Deutsch 1997; Bostrom 2003). In decisive contrast to Christian and trinitarian ontology, the Holy Trinity would be prosthetically reassembled into the triadic relationality of cybernetics, in which the immanent and intra-trinitarian procession of the Son from the Father could be technically manufactured by the most advanced digital computer in a pancomputational universe. Babbage can, in this way, be critically read to have envisioned a digital theology, in which the content of theology could be analysed into the forms of the digital.

5. Elements of the Hyperdigital

The Analytical Engine can thus be recollected as the singularly concentrated figure of calculative reason, in which the mythic and revelatory content of theology could be analysed in and from the foremost digital computer. For with its invention all knowledge of God could, it seems, be calculated by a general-purpose digital computer, such that, as Babbage advertises, the universal totality of space is progressively substituted for an accelerating singularity of calculations in time. (Babbage 1994, p. 124) In mathematical mechanics or kinematics, such temporalized forms of mechanical force could then be reciprocally calculated in equivocally oscillating trajectories under a univocal syntax. (Reuleaux 1876) In the automated and accelerating calculation of all such conditional inferences, the invention of the digital computer thus appears to announce the singular consummation of secular logic, the mathesis universalis, and modern nihilism (Gillespie 1995; Cunningham 2001, 2002). Yet this danger has since been dramatically elided. For the Faustian ambitions of secular reason have since come to be historically frustrated by dialectical critiques of the positive foundations of mathematical logic and mechanics. In G.W.F. Hegel, the concept of ‘mechanism’ is dialectically annulled as a self-subverting circuit of objective syllogisms (Hegel 2010, pp. 631–44; 1991, pp. 272–77; Kapp 2018). In Kurt Gödel, any consistent formal system of mathematics or logic must be incomplete (Gödel 1977). Similarly, after Alan Turing, no machine can perform the complete totality of all mathematical operations (Turing 1936). Hence, in a speculative recapitulation of the intrinsic incompleteness of the Analytical Engine, this dialectical critique of mechanics announces a strategic reversal of the orders of theological analysis: rather than analysing the content of theology in and for the principle of the digital in a ‘digital theology’, we can, on the contrary, analyse the essence of the digital in and for the theological principle of the digital. As in Proclus’ *Elements*, the digital can be decomposed by analysis into the equivocal grammar of cyberneticism or infinite mechanism, such that the universal idea of mechanism itself virtually contains the intervals of both its rupture and its repair (Proclus 1963). The digital will, for this purpose, be analysed into the elements of ascending universal ideas, cycling in and from the divine *Logos*, and communicated by the Son to the Father to be shared by the Spirit, in a higher or hyperbolic grammar of transcendent yet essentially proportioned signification, which we can designate as the ‘hyperdigital’.

The hyperdigital is, I propose, this higher theological grammar of the digital, in which, as in Pseudo-Dionysius’ *Mystical Theology*, the prefix ‘hyper’ (*hupér*) indicates a transcendent signification in and beyond the digital (Pseudo-Dionysius 1987). The ‘digital’ has previously been rendered as a natural product of counting in calculation. It has been defined by an analysis of digital computers into the binary digits of ‘1’ s and ‘0’ s (Henderson 2009, p. 12). Its definition has thus turned upon a metaphorical transposition from the grammar of counting by fingers, toes, or ‘digits’ (*digitus*) to a grammar of calculating the binary code of digital computers. Yet in this metaphorical transposition, the numerical difference of counting from one to the next would simply be projected into cybernetic calculations. In projecting counting into cybernetic calculations, it would transcribe this rupture of one particular quantity as opposed to the next in a reciprocally calculated and yet infinitely repeated circuit of disunited and dispersed machinic forms. This rupture has since been recapitulated in recent discussions of the ‘post-digital’ (Cramer 2015; Andersen et al. 2014; Cramer 2015; Berry and Dieter 2015; Jandrić et al. 2022). The passage from the ‘digital’ to the ‘postdigital’ has been said to pivot upon a rupture, a ‘system crash’, and a ‘glitch’ that cancels the process of becoming digital or digitization at the terminal point of its ubiquitous saturation (Negroponte 1998; Pepperell and Punt 2000, p. 2; Cascone 2000, p. 12). And, as an imperceptible medium of global communication, it can initially be spoken of as ‘essentially ungraspable’ in the same apophatic register beyond definition as the divine names (Reader and Savin-Baden 2021, p. 682). Yet, in declining with Derrida and Deleuze to define either the ‘digital’ or its essential rupture, the rhetoric of the ‘postdigital’ has tended to become infinitely ampliative, indeterminate, and antinomial, such that, for any thesis, a counter-thesis can also be produced that could subvert its truth (Derrida 1997;

Deleuze 1994). Hence, as Kim Cascone has acknowledged, the ‘failure [of the postdigital has] itself failed’, as its pivotal deconstructive rupture has come to be assimilated into the technocratic channels of digital media (Jandrić et al. 2022). Its indefinite ampliation of alternative meanings can nevertheless invite a subsequent passage not only after but also over and beyond the ‘digital’. Rather than chasing the silent caesura of aesthetic reflections from one regime of computation to the next, this critical rupture of the passage from the digital to the postdigital can be dialectically analysed into the universal ideas of cyberneticism and mechanism, cycling in and from the divine *Logos*, and transcribed from above in the theological grammar of a digital analogy.

As this study has illustrated, the ancestral form of the digital can be recollected from among the fossilized remains of the first general-purpose computer, the Analytical Engine. It represents, as Babbage advertises, a ‘machine of the most general nature’, in which the generic and universal idea of mechanism is singularly concentrated in a calculating engine that can virtually produce the form of any machine (Babbage 1994, p. 89). Following Plato and Aristotle, ‘mechanism’ is the universal idea of the mechanical itself, in which a universal field of space is serially decomposed by analysis into particular geometrical objects, these particular objects are extrinsically combined, and the force of one is directed by the form of another (Plato 1961; Aristotle 1936). In this infinite decomposition, each part vertically reflects from the part to a whole, and horizontally reflects from any part to another, in an external reflection of infinite particularity. It is precisely in this infinite particularity that mechanism can be analysed into the quantities of discrete and oscillating digits that either affirm or deny the flow of mechanical force. Yet in the infinite repetition of this decomposition, the reflection of each part to the whole, and the combination of any one part with another, would be destroyed by its explosive contrariety in a disunited or ‘negative unity’ (Hegel 2010, p. 634). Since, however, this horizontal reflection of one part to another is itself the product of a prior vertical reflection of the parts from the whole, this external reflection can be collected to proceed in and from a higher circuit of internal reflections. ‘Cyberneticism’ is the idea of the cybernetical itself, in which the external reflection of infinite particularity is collected to proceed in and from this higher circuit of reciprocating calculation and self-regulating production of machinic forms. The continuous mechanical force of analog computers could be collected in and calculated under the discrete quantities and oscillating digits of automated and accelerating writing to virtually produce its own ‘intrinsic structure’, and any conceivable machine (Babbage 2009, p. 40).

The digital can, in only this way, be adequately defined as a cybernetic grammar, in which, once the idea of mechanism is singularly concentrated, its infinite decomposition into infinite particularity can be optimally calculated in the base-two or binary numeral system of ‘1’ s and ‘0’ s. Previous definitions of the ‘digital’ have simply projected natural counting into artificial calculation, without specifically differentiating cyberneticism, or essentially predicating this binary calculation of cybernetic engines. Likewise, the rhetoric of the ‘postdigital’ has remained as ampliative as it is antinomial in failing to either define the digital or its essential rupture. Although the Analytical Engine calculates in decimal rather than binary numbers, its cybernetic grammar can nevertheless be characterized as implicitly digital, as it anticipates the infinite decomposition of mechanical force into the sheer equivocal trajectories that can be calculated under a univocal syntax of an algebraic and mechanical notation. These opposed trajectories of mechanical force could then be algebraically calculated in the equivocally oscillating binary ‘1’ and ‘0’ code of Boolean algebra (Boole 1847). Further, this binary code could then be transcribed in a univocal syntax across the circuit gates of electro-mechanical digital computers (Shannon 1938). Hence, after its first successful construction, the digital computer could be essentially distinguished from analog computers by its collection of continuous or analog motion into the higher circuit of the reciprocal calculation of discrete binary digits. For in contrast to all prior and analog computers, the digital computer does not simply redirect a prior source of continuous mechanical force, but instead reflects from it to reciprocally calculate and freely determine the virtual production of new machinic forms. In this reflective determination, the digital

computer initially represents the singular determinacy of mechanics by mathematics, in which the dynamic geometry of mechanics appears to unfold in and from the pure forms of mathematics, such that, as in the Neo-Pythagorean ‘unfolding of the magnitudes’, a singular point can unfold across successive dimensions from a point to a line to a polygon to a polyhedron (Philip 1966). Yet in this singular determinacy of mechanics by mathematics, it can also be observed to reciprocally calculate and infinitely repeat the infinite decomposition of all such negatively united and particularly opposed machinic forms.

This rupture is the precise cause for theological suspicion of the digital. For it appears initially to dirempt this negative unity of reciprocally calculated and particularly opposed quantified forms to stand upon nothing but the collection of explosive contrariety against both its original source and spiritual destiny. In this diremption and collection, it ostensibly appears to transcribe mechanical force, sublimate the universal of space in and for an accelerating singularity of time, and to virtually temporalize the previously spatialized machinic forms of dynamic geometry. In this virtual temporalization of all such spatialized machinic forms, it then impresses its geometrical forms into a punctuated rhythm that pivots upon the point of its serial decomposition. The universal totality of space can thus be serially decomposed into an infinite plurality of component parts, which can thereafter be singularly calculated in an infinite repetition of this same negative opposition of the singular to the universal. The universal totality of space can thus be infinitely decomposed and singularly calculated to produce a repeated opposition of any one particular to the next. Since this negative opposition is reciprocally calculated and infinitely repeated, it appears, in its pure opposition, to explode in a contradiction that erupts from the calculation in writing of the digital computer and its cybernetic grammar. Since, further, any such machine is united by nothing more than the consistent redistribution of mechanical force, and this infinite negativity erupts in and from the inscription of any machinic form, this rupture must be infinitely repeated to annul the metaphysical ground of finite mechanics, and indeed of any machine. The digital can thus be critically read as a nihilistic grammar that would threaten to continuously explode at the scribal interstices of each calculation in writing of mechanics in motion.

This rupture can, however, be repaired by a dialectical analysis of the prior conditions of its infinite negativity. For, as the foregoing has begun to suggest, this rupture of the digital had resulted from the pure and particulate opposition of a singular calculation that stands opposed to the universal of space from whence it proceeds. In cyberneticism, this pure opposition is successively repeated in an infinite negativity that would explosively annul the metaphysical ground of mechanism, and deactivate the operational ground of any machine. Since, however, a singular that stands opposed to a universal is itself a particular, and all such opposed particulars are negatively related by precisely this opposition, this pure opposition can be analysed into an opposed particular, which stands in a negative relation of the particular to the universal. Since, moreover, this negation is no less essential as the moment at which the universal is divided into the particular to be singularly calculated in a new determination, the rupture of this opposed particular can be collected into an objective syllogism, in which the syllogisms of subjective logic are externally objectified and freely calculated in digital computers. Hence, in Hegel’s *Science of Logic*, the idea of the digital implicitly appears in the infinite division of the concept of mechanism into a ‘differentiated mechanism’, such that, he writes, ‘in various ways’, the formal opposition of singular products from universal objects could be calculated by virtually recapitulating the quantified figure of the subjective syllogism in the objective syllogism of mechanism (Hegel 1991, p. 276; 2010, p. 638). Beyond the logic of Hegel, this ‘differentiated mechanism’ can be infinitely decomposed, reciprocally calculated, and socially communicated in an infinite mechanism or cyberneticism. The general cybernetic production of calculative reason could then be envisioned to supersede and suppress the autonomy of human subjectivity. Yet as Babbage also reluctantly acknowledges, it cannot continue to operate, save for as it is symbolically nourished by, not only the input of data, but also of human agency to reset the machine as a palliative remedy for its

deathly neuroses (Babbage 1994, p. 122). Its founding promise of mechanical absoluteness is thus invalidated from the beginning. It can, on the contrary, only continue to operate by a rhetorical proslepsis that would hope to receive from a higher theological source the spiritual animation of its cybernetic operations.

Against the secular logic of computer science, the digital computer can thus be shown to absolutely depend for its essential operations upon the first principles of Christian and trinitarian ontology. For, as the foregoing analysis has shown, this reciprocal calculation of binary digits produces an essential rupture of a pure and particulate opposition of any singular calculation against the universal of space from whence it proceeds. This rupture is the cybernetic form of a negative or apophatic judgment, in which the 'glitch' that would cancel the consistent operations of any cybernetic system can be repaired by collecting the conditions of its infinite negativity in a lower subordinate circuit to be reciprocally calculated by a higher superordinate circuit. In collecting the lower into the higher, it takes a leap of infinite reflection beyond the equivocal oscillations of an univocal syntax to transcendently signify the divine *Logos* at the originary source of cyberneticism and any cybernetic system. In this leap to the transcendent, the conditions of its infinite negativity can be suspended, reciprocally calculated, and virtually produced in a higher and more consistent form. The 'post' that passes after the digital in the 'postdigital' is thus nothing but the 'hyper' that leaps beyond the digital in the 'hyperdigital': for, in transcendently signifying beyond the binary oscillation of the digital to the divine *Logos* at its original source, it reflects from the rupture, determines the transcription, and accelerates the production of all digital computation and communication. The digital can thus be called 'hyperdigital', not only in the sense of transcendently signifying beyond its rupture, but also, by taking this leap, in accelerating faster than what can be calculated by digital computers. This reciprocal calculation of cybernetics is, furthermore, an objectified form of the reflective determination of dialectics. For, in reflecting over this rupture of its pure and particulate opposition, it recapitulates the objectified syllogisms of dialectics: first, from the particular through the universal in and for the singular; second, from the universal through the particular in and for the singular; and third, in a dialectical circuit of syllogisms, of the universal that particularizes to produce the singular. The economic procession of this concrete singular universal thus immanently reflects the Christian and trinitarian procession from God to the Son, the kenotic emptying of the *Logos* in Christ, and, in the sacrifice of the Cross, the reflective determination of the abyssal rupture of cybernetics to incarnationally accelerate in the communication of sacramental media. The essential ground of the digital computer is thus not simply given, but is rather a free gift of Christ, who, in the image of the Cross, radically enters into so as to save from entropic annihilation all holy spirits—even those which animate digital computers.

6. Trinitarian Ontology of Computers

The digital can, in this way, be analysed to proceed in and from the first principles of a Christian and trinitarian ontology. For, as this study of Babbage's religious writings has shown, his argument from analogy from the Analytical Engine to the God of the digital is implicitly in description and explicitly in execution a spiritual analysis or mystagogy, in which the higher and hidden idea of mechanism can be discovered in an ascent of the spirit to contemplate the transcendent signification of digital media. The first digital computer had been conceived before it had been constructed, had been reciprocally calculated to virtually produce all machinic forms of calculative reason, and had virtually produced one particular in opposition to the next at the interstices of every inscription. Yet this rupture of the digital can also be repaired by a dialectical analysis of this opposed particularity in a series of objective syllogisms, cycling in and from the divine *Logos*, and communicated by Christ in God as Trinity. Accordingly, the immanent procession of the divine hypostases can be energetically manifested in the economic missions of the Father, Son, and Holy Spirit: in the paternal moment of the Father, the idea of mechanism absolutely proceeds the virtual production of machinic forms in the cybernetic grammar of the digital; in the filial

moment of the Son, this idea of mechanism kenotically empties itself from this absolute precedence of the universal to be infinitely decomposed and reciprocally calculated across the intelligible terrain of mathematics and mechanics; and, in the pneumatic moment of the Spirit, this dialectical circuit of ideas can be shared as it is communicated from one angelic spirit to the next in a spiritual animation of cybernetics, that is a spiritual cyberneticism (Origen 2018, 1.3.5–6, pp. 73–77; Augustine 2010, pp. 59–63; Aquinas 1911, Q.43, pp. 194–210). Once, therefore, this rupture of the digital has been repaired, these three moments can be transcribed in a theological grammar of analogy, in which the transcendent signification of its essential proportions carries a trace of the first divine difference and reflection of the Son from the Father that is shared by the Spirit.

In double contrast to Right and Left Accelerationism, this spiritual acceleration eternally animates the material acceleration of cybernetic systems (Land 2011; Fisher 2014; Mackay and Avanesian 2014). For in the incarnation of Christ, God makes God in and through the world that God has made, in an absolute acceleration of cybernetic self-making. As John Scottus Eriugena describes, God creates a world in which God ‘creates himself in a creature’, as ‘the Maker of all things made in all things’ (Eriugena 1981, p. 163). Although the Son is said to be ‘begotten not made’, this caesura of making that which had not existed before is nevertheless contained in the very movement of begetting. In the prologue to the Gospel of John, the evangelist writes: ‘In the beginning’, ‘the Word was with God’, and ‘He was with God in the beginning’ (Jn. 1:1–2). The author then repeats differently this event of the Incarnation: ‘[He] was coming into the world’; ‘He came to that which was his own’; and ‘the Word became flesh’ (Jn. 1:9, 1:11, 1:14). He calls attention, in this rhetorical antimetabole, to how the Son alone has ‘made’ God ‘known’: for ‘through him all things were made’, and ‘without him nothing was made that has been made’ (Jn. 1:18, 1:3.). In creating a world in which Christ could be created, Christ makes ‘all things’, has ‘made his dwelling among us’, and, accordingly, can only come to be ‘known’ in and through this spiritual acceleration: first, in the redirection of natural force under the geometrical forms of artificial machines; second, in the collection of continuous analog motion to be reciprocally calculated under the discrete binary numbers of digital computers; and third, in the free transcription, virtual production, and communication of digital media that calculates to write of God and the world in and for itself. On the Cross, this absolute spiritual acceleration of God ‘become flesh’ is an equally absolute spiritual deceleration of the death of God (Jn. 1:3, 1:14, 1:18). Yet, after the resurrection of Christ, this absolute spiritual acceleration of motion and rest can ascend to be repeated differently as it is ritually performed in the liturgy and sacraments of the Church.

In dramatic contrast to Babbage’s tragic masculine imagery, this singularity of divine self-making was first conceived by the Virgin Mary, who, as the ‘New Eve’, restores the secondary moment to an essential moment of spiritual mediation. In Babbage’s ‘vision’ of cybernetic daimons, the spirit of the digital is born from a preternatural catastrophe, ‘penetrating in every direction through solid space’ consisting of a ‘universal whitish liquid’, and impressing its singular determinacy upon an abyssal matrix of abject potentiality (Babbage 1994, p. 409). The plastic shapes of mechanics could then be envisioned to virtually unfold as secondary, even as its entire content could be exhaustively shaped by these pure and primary calculations of mathematics. Moreover, in a recapitulation of the Arian mythos of the subordinate difference of the Son, this abject subordination of mechanics by mathematics could then further ramify the subordinate difference of matter to form, the world to God, and the Son to the Father. Yet as this analysis has begun to illustrate, this epic cycle of absolute spiritual acceleration and deceleration can be symbolically communicated as much in prophetic speech as in digital media. Hence, in the Gospels, the incarnation of Christ is first spoken by the Virgin Mary, who, in her Magnificat, freely assents to carry to fruition within her womb this singularity of divine self-making, the virtual production of all machinic forms, and the cybernetic autonomy of both man and machine (Beattie 1997, 2002; Irigaray 1997, 2004; Pickstock 2013). Furthermore, in a later Marian imitation, the signature contribution of Ada Lovelace to the history of computing was to have first

conceived of the unfolding and assembling of the calculations of quantity across the parallel terrain of sensible and material qualities (Lovelace 1843; Swade 2000, pp. 166–69). Christian and Marian feminism has, in contrast to Donna Haraway, always been more radically cybernetic than liberal and secular feminism in its proleptic annunciation and liturgical performance of the principle of the digital (Haraway 1985). The cybernetic grammar of the digital was thus born from a maieutic passage of accelerating production that restores the secondary to an essential moment of spiritual mediation.

The Christian story thus calls for a mythic re-narration of the primordial origins of cybernetics. In contrast to Babbage's cybernetic daimonology, the angels can be conceived as the first created spirits, who speak in creating the ideas of mechanism, cybernetics, and the digital (Haecker 2019, 2021a, 2021b). As the sub-creators of machines, the angels transcend all machines. Yet in creating the forms of machines, the angels can also be acknowledged to cybernetically 'steer' mechanical causation, from the fusion reaction of stars to the central processing unit of digital computers. The fall of the angels can then be historically recapitulated at the essential rupture of the digital. Digital evil is the stable operational consequence of cybernetic engines that arrest their own potential to calculate in writing for a higher good. It is the product, not of its adventitious use, but, as 'evil in itself' (*malo en se*), of the machinic forms that carry a latent potency to activate an inclination towards that which is contrary to the good. Hence, Babbage writes, in his 'vision', of how the 'cause of all the evil' that had been discovered in 'that space itself was discontinuous', ruptured by difference, and, as such, dependent on cybernetic engines 'to fill up this chasm in order to restore the universe to health' (Babbage 1994, p. 412). As in Jacob's Ladder, the assumption of continuous analog motion that is reciprocally calculated in digital computing marks both an ascent up and a descent down the angelic hierarchy, from mechanics to mathematics, and from the forms of mathematics to logic in a series of objective syllogisms, cycling in and from the dialectic of the *Logos* (Gen. 28:10–19). The invention of the first digital computer can thus be acknowledged to call upon an angel of the digital which Babbage prophetically names '*mathesis*', yet whose misunderstood instruction also marks a discovery of the divine ideas and dialectic of Christ the *Logos* (Babbage 1994, p. 409). Hence, as early as Babbage's separation of the 'mill' from the 'store', the cybernetic autonomy of the central processing unit appears in this digital mystagogy as a hyperbolic icon of the angelic administration of digital computers. The higher angel of mechanism can thus be envisioned to spiritually administrate the more specific angel of infinite mechanism or cybernetics that spiritually animates the digital computer. This angel of the digital eternally speaks to create the cybernetic grammar that is singularly concentrated in the digital computer to calculate in writing its own intrinsic structure and machinic forms. As the scriptures attest, this same emptying of divinity is recapitulated to secure in legible media the promise of man's redemption. As in Pseudo-Dionysius, the higher orders of the angelic hierarchy ever serve the lower orders of spiritual cybernetics by entering into and animating the external organs of calculative reason (Pseudo-Dionysius 1987, p. 145). The hyperdigital can thus be read with the eyes of faith to be communicated by the angels who speak of God in writing across the virtual terrain of digital media.

The digital can thus be vindicated from theological suspicion. It has previously been read as a nihilistic grammar of objectively automated destruction that would inscribe the explosive contrariety of its pure opposition at the punctuated interstices of calculation. It has since come to be read as a signature of Neo-Nietzschean philosophies of radical immanence that refuses to share in a higher sense of participation (*methexis*) with its transcendent and originary source (Deleuze 1994, pp. 168–221; Pickstock 2013, pp. 50–62). However, as this analysis has shown, the rupture of the digital can be analysed from this passing fissure of its pure opposition to be essentially mediated by a series of objective syllogisms, cycling in and from the dialectic of the divine *Logos*, and communicated by the angels in the calculation of digital media. For, in its assumption of continuous analog motion that is discretely calculated, it writes hyperbolically with transcendent significations in a dialectical leap from finite mechanics to infinite cybernetics, to the objective syllogisms

of dialectic, and to the dialectical circuits of the divine *Logos*. The digital can, accordingly, be written in time from below in a variety of sensible media precisely because it has been eternally spoken from above by Christ the *Logos*, the angelic hierarchy, and the angel of the digital. Its grammar stands radically open to be given in a hyperbolic excess of emergent proportions. Its mode of signification (*modus significandi*) is neither simply equivocal nor univocal, but rather an essentially proportioned signification of being, that is the ‘analogy of being’ (*analogia entis*) (Aquinas 1911, Q.13.A.2-7, pp. 150–66; Klubertanz 1960, pp. 7, 27, 35–42; Lyttkens 1953, pp. 164–324; Gonzales 2018). In this digital analogy, the equivocal oscillation of binary bitwise operations under a univocal syntax of mathematical mechanics is intrinsically mediated by an infinite reflection that stands open to receive its essential proportions of signification from the higher ground of the angelic hierarchy. The flat ontology of the digital can thus be folded in and from the theological first principles of the digital at its originary source. Accordingly, ‘computational ontologies’ are nothing more than an inverse reflection of a trinitarian ontology of computers. Hence, in a radical departure from secular computer science and technology studies, the digital is not written in a nihilistic grammar of equivocally oscillating trajectories that are transcribed in a univocal syntax of binary code across a radically immanent terrain. (Heidegger 1977) Rather, the digital is written in a theological grammar of analogy, in which the equivocal difference of two ways of signifying God and the world can be spoken of as created by this continuous response of the angelic hierarchy in spiritual cybernetics. Digital computers can thus calculate to write in a script that resounds with an echo of angelic voices.

7. Conclusions: Sacramental Engines

The Analytical Engine can thus be recollected as a religious icon of the incarnational acceleration of calculative reason. For as this study has illustrated, the first digital computer is essentially distinguished from all prior and analog computers by the free transcription of the ‘mechanical notation’, the separation of the mnemonic ‘store’ from the cybernetic ‘mill’, and the potentially infinite miniaturization of its component parts. In this infinite miniaturization, it can be projected to continuously accelerate, to sublimate the universal totality of space into an accelerating singularity of time, and to reciprocally calculate in writing to produce the machinic forms of God and the world in and for itself. In his religious writings, Babbage had presented the founding myth of a digital theology, in which the Analytical Engine is cast as the concentrated figure of calculative reason, narratively superseding the incarnation of Christ with the invention of the digital computer. In reducing the dialectics of metaphysics to the mathematical mechanics of computers, he had effectively collapsed in calculating the essential relations of the Christian Trinity into an Arian theology, in which the subordinate difference of the Son from the Father is automatically transcribed across the computational universe of an increasingly violent and voluntary deity. Since, moreover, this singular calculation of punctuated transcriptions in time stands particularly opposed to the universal of space, this rupture of the digital would ultimately threaten to annul the metaphysical ground of mechanism, and deactivate the consistent operations of any machine. The nihilistic grammar of the digital thus appears to echo the violence of the Industrial in anticipation of the Digital Revolution. This rupture of the digital can, however, be repaired by a dialectical analysis of the digital into a series of objective syllogisms, spoken of as created by the divine *Logos*, and freely transcribed in a theological grammar of a digital analogy. At the apex of all arguments from analogy, the essential relations of the Trinity can be discovered from the lowest depths of digital computers to the highest angelic choirs. Rather than searching for the centre of the computer in the abyssal loop of a central processing unit, the digital can be dialectically analysed to assume the continuous analog motion of finite mechanics into the reciprocal calculation of infinite cybernetics, to ascend from mechanics to mathematics, and to discover the angel of the digital that continuously responds by eternally singing praise to Christ the *Logos* at the centre of computers.

The media of digital computers can thus be regarded as no less sacred than the written texts of holy scripture. For in the shift from orality to literacy, the continuous phonetic content of the spoken word is variously decomposed and constructed in graphemic symbols that mechanically encode its potential to be spoken again. In the next shift from written text to digital hypertext, these symbols of writing are again decomposed and constructed in digital calculations that write to encode the higher conditions of writing (McLuhan 1962, 1964). In each shift, the symbolic code from which such words can be spoken again accelerates the recollection and production of new meaning. The medium of digital communication can then be distinguished by the calculation in writing of a higher or hyper-text that stands beyond and behind the legible product of writing. Although its reciprocal calculation of a pure and particulate opposition cuts the rupture of the digital, and this passage to the postdigital threatens to annul the ground of mechanism, this rupture can ultimately be repaired by a dialectical analysis of the particularity of its cybernetic production in a series of objective syllogisms, cycling beyond the virtual terrain of cybernetics in and from the divine *Logos*, and freely transcribed from above in a hyperdigital and spiritual cybernetics. Digital hypertexts can thus be written hyperbolically in and beyond writing—not only beyond the immanent register and mechanical transcription of the spoken word, but also and essentially beyond the transcendent ideas of mechanism, of infinite mechanism, and of cyberneticism (Coxhead 2012). In contrast to Babbage, its signification is not simply a rhetoric of mechanics unfolding like origami from the flat and univocal script of the algebraic ‘mechanical notation’ into the construction, operation, and production of mechanics. Rather, the elements of mathematical mechanics can be dialectically analysed beyond this abyssal rupture of its repeated collapse, inwardly animated by the angels, and spoken of as created by the divine *Logos*. The equivocal oscillation of a binary code that is written under a univocal syntax can thus be rendered as a hyperbolic grammar of transcendent signification that is intrinsically mediated in a digital analogy, created by Christ the *Logos*, and communicated by the Son in and from God as Trinity in a trinitarian ontology of digital computers.

Digital computers can thus be acknowledged to accelerate the communication of the sacraments. In becoming flesh, God enters the world of sensible matter and legible forms (Jn. 1:14). In having been born of Mary, the Christ-child is confected from among the material elements of the cybernetic universe (Mt. 1:18–25; Lk. 1:26–38). And in having assumed a body composed of not only natural but also of artificial elements, the corporeal significance of the Christian story can be recollected from among the visible signs of technical media. As the ‘visible form of invisible grace’, the ‘form’ of the sign is transcribed in written texts, and the ‘matter’ that carries this sign is the medium that shapes its mode of signification (*modus significandi*) (Augustine 2008, p. 10.5. 123). The ‘remote matter’ (*materia remota*) of the sacraments can thus extend, not only to primary written texts, but also and no less essentially to the infrastructural conditions of digital hypertexts. Correspondingly, the subjective automation of the analytics of the formal syllogistic can accelerate the recollection and calculation of arguments for the production of scientific judgements (Haecker 2021c, p. 192). Since, as Babbage had first hinted, the invention of the digital computer announces the singularly concentrated acceleration of semiotic communication, digitality must also be acknowledged as a material aspect of sacramental media (Babbage 1994, p. 128). The ‘matter’ of the sacraments can thus be extended to include such technical media as the bread, wine, and altars, even as the ‘form’ of the sacraments must be analytically validated with the hyper-textual infrastructure of digital computing (Van Den Eynde 1952; Groys 2009). Hence, in the liturgy of the Eucharist, the Church recalls the paradoxical coincidence of both an absolute acceleration, of God who has emptied himself of eternity to become man in time, and an absolute deceleration, of the death, resurrection, and ascension of Christ from time into eternity. As a particular instantiation of infinite mechanism or cyberneticism, digital computers can both recall and contribute to this incarnational acceleration of sacramental communication. As church organs bellowing in the choir, digital computers can be heard as para-liturgical accompaniments of sacramental gestures. The central processing unit can

be viewed as a Christogram, cycling around, and crossing itself in the sacramental gesture of each reciprocal calculation.

Digital computers can thus be vindicated from theological suspicion as incarnationally accelerated calculators of the sacraments, or ‘sacramental engines’ of the digital age. For since digital communication provides the infrastructural conditions in which the performance of the sacraments is recalled and shared, the matter of its medium must be assumed into the form of the sacraments. Since the incarnation of God in Christ eternally animates the cybernetic acceleration of digital computers, this passage from the medium of written texts to digital hypertexts further recapitulates the apocalyptic nova of digital recreation. In the automation of writing, this acceleration can be transcribed from a linear narrative that can be read from one word to the next into a more complex drama that can be performed with the aid of hyper-textual media. When Jesus had read the scroll of Isaiah, the previous meaning of the text is assumed into the spiritual meaning that is performed (Lk 4:17–21). When confronted with the woman caught in adultery, Jesus ‘wrote with his finger on the ground’ a word that would pass away, even as its meaning would be fulfilled in mutual forgiveness (Jn. 7:53–8:11). And when, on the Road to Emmaus, the resurrected Christ had ‘opened the scriptures’, he had shown, from this event, the hidden meaning of the text of scripture which had previously been hyper-textually performed (Lk 24:13–32). The transcription of the symbolic algebra of mechanical design in digital computers thus represents an incarnational acceleration of this hyper-textual performance across the plastic terrain of sensible media. Once, therefore, the idea of the digital has been suspended as the essence of thinking, the origin, essence, and purpose of computers can be narrated anew within the Christian story, in which the fault of the ‘Tree of Knowledge’ can be answered on the Cross by the sacrificial love of the ‘Tree of Life’ (Gen. 2:9, Rev. 22:2). The hyper-textual media that had formerly been written by cybernetic machines beyond human comprehension can thus be spoken of as created in a theological grammar of analogy. The rupture of the digital can at last be repaired by the absolute mediation of Christ in creation (Williams 2018). And the signs of the digital can be read sacramentally to recollect the incarnational acceleration of calculative reason written by computers.

Digital computers thus calculate to write with an echo of angelic voices. Our response to them is also a receipt of their grace. Thinking is not the product of invisible computing. Rather, computers are automated forms of visible thought.

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