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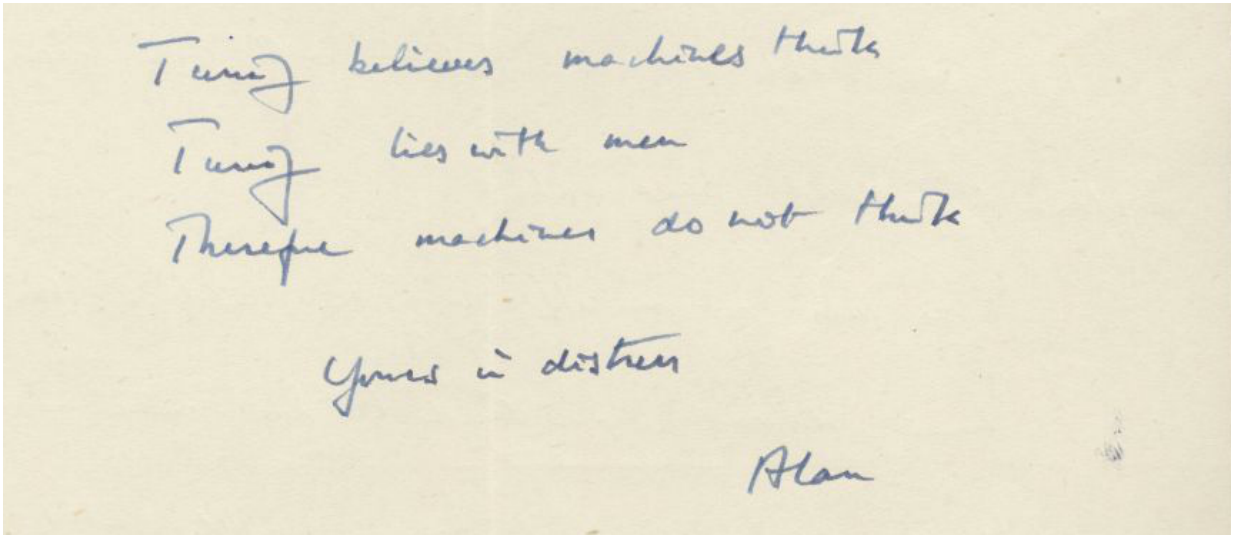
A Queer History of Computing

By Jacob Gaboury
Feb 19, 2013

This is the first post in a series on the queer history of computing, as traced through the lives of five foundational figures. It is both an attempt to make visible those parts of a history that are often neglected, erased, or forgotten, and an effort to question the assumption that the technical and the sexual are so easily divided.



Alan Turing, Letter to Dr. N. A. Routledge, AMT/D/14A Turing Archive

There are many ways of telling the history of universal computation, and many origins of the technologies we now consider computational machines. A longer history might begin with Gottfried Leibnitz and Isaac Newton's simultaneous development of modern

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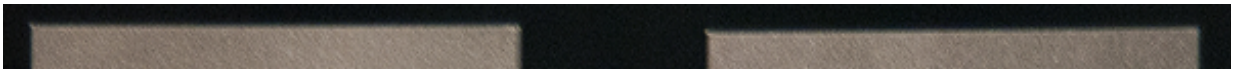
Most every history would certainly include the contributions of Alan Turing, an English mathematician who is considered by many to be the father of computer science. In his relatively short career Turing formalized such concepts as "algorithm" and "computation," he helped crack the Nazi Enigma Machine during the Second World War, was a pioneer in the field of artificial intelligence, and developed early research on such concepts as neural nets, morphogenesis, and mathematical biology. Turing was also an openly gay man who, in January of 1952 was convicted of Gross Indecency by the British government under the 1885 Labouchere Amendment, made to undergo chemical castration, and ultimately committed suicide in June of 1954.[i] The subject of numerous books, films, and works of art, Turing is perhaps the most widely recognized computer scientist in the field's short history. He is also the most recognizable queer figure in this history. As such, it is necessary to begin with Turing, not simply for the visibility of his difference, but for the fundamental role he played in defining the limits of computation, and the possibility to look beyond those limits in identifying a queer history of computing.

Homosexuality was by no means unheard of in England at the start of the 20th century, and by some accounts it seems to have been common practice among many college-aged students in elite universities such as Cambridge, which did not admit women until 1948.[ii] Still, homosexual activity had been explicitly illegal since the end of the 19th century, when it was famously used in a pair of legal cases against Oscar Wilde beginning in 1885, leading to his imprisonment and eventual exile in 1897.[iii] Given this legal status, what is most striking about Turing is how open he was with his sexuality, which seems to have been common knowledge among friends and colleagues. As Elizabeth Wilson notes in *Affect and Artificial Intelligence*, Turing's relationship to his sexuality seems to be less one of repression and shame, and more a kind of naïve amusement. If this attitude was not shared by others at the time, it was at the very least tolerated among Turing's friends and associates.

Donald Michie, one of Turing's wartime colleagues at Bletchley Park,[iv] recalls that "Bletchley had some flamboyant homosexuals,"[v] and that, despite the assumption that homosexuality would be considered a national security risk due to blackmail and other threats, it does not seem to have impeded Turing's work for the government, at least not during the war. For many in those days, homosexuality was an open secret, if it was kept secret at all."[vi] But while Turing's sexuality is not in dispute, the effect it may have had on his life and work is much more speculative.



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Alan Turing and Christopher Morcom, 1928

Turing's earliest and strongest romantic interest was with a young man he met at school named Christopher Morcom.[vii] Morcom, like Turing, was an aspiring scientist and mathematician, and Turing viewed him as both a peer and an inspiration, and as someone with whom he might share a budding enthusiasm for the technical world. While any romantic feelings Turing may have felt appear to have been unrequited, the two developed a powerful friendship. On February 7, 1930, two years after meeting Turing at University, Morcom fell ill with bovine tuberculosis, and passed away six days later on Feb 13. On the night of February 7, Turing recalls having a premonition of Morcom's death, at the very instant that he was taken ill and felt that this was something beyond what science could explain.[viii]

The death of Morcom would have a profound effect on Turing, particularly in shaping his views on religion, mortality, and the materiality of the soul. Turing had been a harsh critic of determinism, and with the death of Morcom he hoped to find a way to account for concepts such as free will and the spirit in a grounded, material way. It is this philosophical disjuncture that would lead Turing to theorize the limits of procedural knowledge, a concept that is central to his definition of computation in *On Computable Numbers*. To suggest that it was his unrequited love for a young man that inspired Turing to engage the questions that would establish a definition of computation would be facile, but to ignore the significance of these details parses what is technologically

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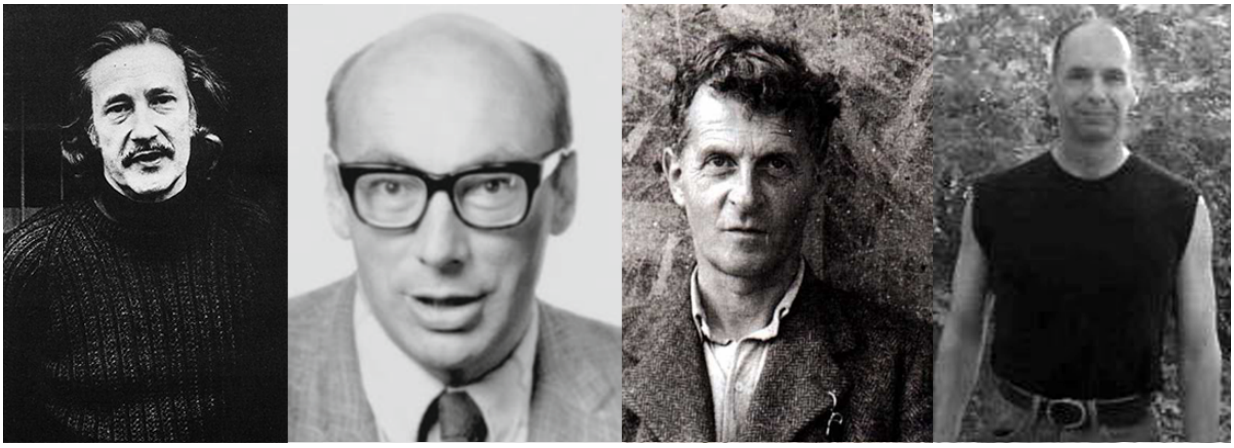
due to the difficulty in applying anachronistic language to historical figures such as Turing, or because in many ways Turing's work does not immediately lend itself to a radical queering. While we might argue that computers have come to play an important role in the formation, organization, and articulation of modern queer identity, this may have less to do with some aspect of computation that is inherently queer, and more to do with the broad indifference of these technologies toward such distinctions and the ease with which they facilitate contact and produce community.

Still, it is significant that one of the foundational figures in the modern history of computing was an openly gay man. We know more about the details of Turing's private life than any other figure in this history, due no doubt to his exceptional significance as both a scientist and a homosexual, categories that we cannot easily separate.



Turing's biography is no doubt familiar to many, particularly in the year following innumerable events celebrating the centenary of his birth, and a very public campaign for a posthumous apology for Turing's treatment by the British government following his arrest. Perhaps less familiar, though, is the genealogy of influence that radiates out from Turing, and which includes several foundational figures in the history of computing, all of whom were queer men.[x] These men were friends and acquaintances, mentors and colleagues, each driven by a passion for mathematics and the emerging field of computer science. As I will show, it is unclear what knowledge, if any, each had of the other's sexuality, or what effect such knowledge may have had on their relationships both professional and personal. Nonetheless, it is significant that such a connection exists, and in this connection lies the beginnings of a speculative history of queer computing, beginning at the very origins of computation itself.

Still, this connection is in part a fabrication, an attempt to make narrative that which largely escapes history. For most historians of technology, questions of sexuality are

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and an almost total lack of personal biographical information available in existing historical accounts. Even the archives of these figures are in many cases lacking, as material relevant to the personal lives of these men is often excluded or withheld.

This division between the personal and technical is significant, and with few exceptions these men seem to have internalized this distinction, living lives that moved between worlds both public and private. These men lived in times radically different than our own, times in which the contexts and dispositions surrounding homosexuality were undergoing dramatic transformation. Just as computers evolve over the course of the twentieth century from simple tabulating machines to complex, interactive, expressive systems, homosexuality is also transformed and recoded, burdened with visibility and identity.

What then is the significance of the sexuality of these men? Why should we insist that they be remembered not only for their technical achievements, but as part of a broader queer genealogy? In part we may hope that, by incorporating them into the history of queer struggles for recognition and visibility, we recuperate and validate a part of their lives that was deliberately hidden. As historian Heather Love suggests, "by including queer figures from the past in a positive genealogy of gay identity, we make good on their suffering, transforming their shame into pride after the fact."[xi] Yet in doing so, Love argues, we erase the negative dimension that profoundly affects queer historical subjects. Theirs is not necessarily a history of pride and redemption; often it is a history of shame and even death. Rather than ignore this contradiction, my hope is to foreground it. It is in the disjunction between the professional and personal lives of these men, in the apparent incompatibility of sexuality and computation that I hope to develop a queer capacity within the history of computing.

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contemporary debates over the life and legacy of Alan Turing. However the goal of this project is not biographical; it is not my hope to simply identify existing queer figures in the history of computing as an inclusive gesture, as a way of queering history by simply demonstrating that, as in all parts of life, queer people were there. Instead I hope to suggest that queerness is itself inherent within computational logic, and that this queerness becomes visible when we investigate those cleavages that partition the lives of these men into distinct technical and sexual spheres of existence. Ultimately I hope to show that there exists a structuring logic to computational systems that, while nearly totalizing, does not account for all forms of knowledge, and which excludes certain acts, behaviors, and modes of being. By situating this work historically, we can address computation from those early moments of experimentation and emergence before the field crystallizes into a discipline and an ideology. In doing so we discover a kind of liminal technical space of something not yet actualized. Finally it is my hope that through this history we can disturb the archive and begin to draw new connections between the personal and the technical. While it may not be possible to argue that the queerness of these men and of this history is what shapes present day computing technology, in establishing an existing queer history of computing we might critique the tendency to rend the one from the other.

Next segment: Part 2

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[i] This is not to suggest that Turing's conviction was directly responsible for his suicide. In fact it is not entirely clear that his death was a suicide at all. While the hormone treatments he was made to undergo may seem horrific, Turing seemed to take a lighthearted approach to his predicament. While his death by cyanide poisoning – presumably from an apple found on his bedside table – was ruled a suicide, his mother insisted it was a simple mishandling of laboratory chemicals.

[ii] The homosocial environment of British University life is documented in numerous fictional texts of the time, several of which were written by authors of the Bloomsbury group such as E. M. Forster and Lytton Strachey. Perhaps most notable among these is E. M. Forster's *Maurice*, a love story of two men written between 1912-13 but published posthumously in 1971. Other more contemporary examples include Julian Mitchell's play *Another Country* (1983), later adapted into a feature length film (1984).

[iii] Sex between men had been illegal in England since as early as the Buggery Act of 1533, but the Labouchere Amendment made all forms of homosexual contact between men a punishable offense.

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of Turing.

[v] He continues, "The most flamboyant case was Angus Wilson – he later became a very successful novelist – and he had a boyfriend called Beverly. Angus was about that high [indicating small] with flowing yellow hair (I remember it went white later) and Beverly (I forget his second name) was very 'weed-like': very tall. They could be seen shambling along the horizon, a daily sight, as they look their walk around lawns alter lunch." Quoted in: Lee, John A. N. and Golde Holtzman, "50 Years After Breaking the Codes: interviews with Two of the Bletchley Park Scientists" *IEEE Annals of the History of Computing*, Spring 1995, Vol. 17 No. 1, p. 38.

[vi] It seems important to note that, as with much of British society at the time, there is a very particular class dynamic at work here, in which the upper class is often given more leeway with the law and among their peers. Of course this kind of homosexual behavior was not particular to the upper classes, and in fact homosexuality often facilitated a form of cross-class sexual contact.

[vii] Hodges, Andrew. *Alan Turing: The Enigma*. London: Random House Publishing (1992) p. 35.

[viii] Hodges. *Ibid.* p. 45.

[ix] This is not to suggest that Turing's sexuality is not widely acknowledged and discussed. Andrew Hodges – Turing's biographer, archivist, and a renowned mathematician himself – deals with Turing's sexuality explicitly in his writing, going so far as to speculate on the ways in which it may have motivated his personal and professional life. Elizabeth Wilson also deals with Turing's queerness in *Affect and Artificial Intelligence* (2010), though it is through the lens of affect theory and in regards to Turing's contributions to the field of AI. Turing is dealt with most explicitly as a queer subject in Jeremy Douglass' *Machine Writing and the Turing Test* which explores the implications of the Turing test in terms of gender "passing."

[x] Many queer women also make up the history of computing, though they are not connected directly to Turing through this particular genealogy. Lynn Conway is one such figure, who was an early pioneer in the American computing industry, studying at MIT in the 1950s and working for IBM in the 1960s. She would go on to make fundamental contributions to the revolution in Very Large Scale Integration (VLSI) design in the 1980s, and in 1999 would become an activist for transgender rights and visibility.

[xi] Love, Heather. *Feeling Backward: Loss and the Politics of Queer History*. Cambridge, MA: Harvard University Press (2009) p. 32.

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Good work. I trust one of your 5 will be Roger/Sophie Wilson.

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A Queer History of Computing: Part Two

By Jacob Gaboury
Mar 19, 2013

For the preceding segment of this four-part genealogy, see Part 1

In this second part of our genealogy, we move not forward in time, but look back to an encounter that took place between two foundational figures in logic and mathematics, in an attempt to identify the conflicting role of contradiction, misunderstanding, failure, and disagreement in the queer history of computation. While again these figures are well known, the encounter between them is often dismissed as a missed connection and a failed opportunity. As such, it is often relegated to an uninteresting footnote in the history of mathematics. By reengaging this encounter I hope to blur the lines between computing, philosophy, and mathematics, and to disrupt the narrative trajectory that would see Turing as the single foundational figure within this history.

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An Encounter

In the spring of 1939, Ludwig Wittgenstein taught a course at the University of Cambridge on the foundations of mathematics, a topic that occupied much of his work from 1922 through to the end of the Second World War. That same semester Wittgenstein was finally elected chair of philosophy at the university, acquiring British citizenship soon thereafter. At fifty years old, he was an established figure in analytic philosophy, having published his groundbreaking *Tractatus Logico-Philosophicus* almost twenty years prior, and having written extensively on the work of Gödel, Russell, and Whitehead. While Wittgenstein is considered by many to be the most important philosopher of the 20th century, he published very little in his lifetime, and much of his thought and character can only be derived from what survives of his lectures, notes, and seminars. Still less is known of his sexuality, and until the 1980s it was a subject rarely discussed among colleagues or in the many biographies written about his life and work.[i] Even now that Wittgenstein's homosexuality has been largely acknowledged, most scholars are hesitant to imply a connection between his philosophy and his sexuality – that is, between his work and his inner state, emotions, or personality. If, however, in a contemporary light we understand queerness as a structuring mode of desiring, we might view Wittgenstein's thought not as emerging *from* his sexuality, but

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Wittgenstein with Francis Skinner in Cambridge ca. 1933

Wittgenstein is widely regarded to have fallen in love with three men; David Pinset[ii] in 1912, Francis Skinner in 1930, and Ben Richards in the late 1940s.[iii] While it is clear these were relationships of love and affection, the extent to which they were physical is often contested. What seems to make many Wittgenstein scholars uncomfortable in confronting his homosexuality is that it conflicts with the ascetic, almost priestly view of a man so revered by contemporary philosophy. As Bruce Duffy suggests in a 1988 *New York Times* article on the life of Wittgenstein, "In their effort to put forth a plain, unvarnished record of what Wittgenstein did and said, some of these memoirs have almost the feeling of gospels – hushed, reverential, proprietary."[iv] The philosopher – or indeed, the mathematician – as a carnal, sexual being produces a seemingly irresolvable contradiction. Even those accounts that do concede his affection for other men often suggest that those feelings were purely aesthetic or emotional, and were never acted upon. That said, in perhaps the most controversial section of his 1973 biography of Wittgenstein, W. W. Bartley suggests that the philosopher frequently engaged in a kind of anonymous cross-class sexual contact facilitated by public cruising spaces such as parks and high streets.

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> scarcely keep away from it . . . Wittgenstein found he much preferred the sort of rough blunt homosexual youth that he could find strolling in the paths and alleys of the Prater to those ostensibly more refined young men who frequented the Sirk Ecke in the Kärntnerstrasse and the neighboring bars at the edge of the inner city.[v]

These kinds of exceptional spaces as sites for anonymous sexual encounters continue well into the 20th century, and are instrumental in the structure of being and interaction that the author Samuel Delany identifies as *contact*:

> [C]ontact is also the intercourse—physical and conversational—that blooms in and as "casual sex" in public rest rooms, sex movies, public parks, singles bars, and sex clubs, on street corners with heavy hustling traffic, and in the adjoining motels or the apartments of one or another participant, from which nonsexual friendships and/or acquaintances lasting for decades or a lifetime may spring . . . a relation that, a decade later, has devolved into a smile or a nod, even when (to quote Swinburne) 'You have forgotten my kisses, / And I have forgotten your name.'[vi]

Bartley's sources have been called into question by many historians, but it is less the detail of his description than the acknowledgement of an embodied sexuality that is significant to this history; it is the difficulty we often have in finding the sexual in the everyday, in the lived work of a person beyond these exceptional moments of contact. While such effects may be invisible or to a degree, unknowable, that does not mean they aren't real and do not have a direct effect on the world.

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The Prater park in Vienna

In the *Tractatus,* Wittgenstein defines truth as a tautology, that is, a result achieved through the mere repetition of the same meaning. While he insists that there exist religious or ethical truths, he argues that they cannot be put into words, that they are unknowable through language, and that claims to express ethical truths through philosophy must fail. Wittgenstein summarizes the *Tractatus* with the maxim: "What can be said at all can be said clearly; and what we cannot talk about we must pass over in silence."[vii] What does it mean that for Wittgenstein truth is something that can be known but not discussed, that is indescribable? And how does he apply this critique to truths we understand to be beyond language – the truth of the body, or the truth of mathematics?

Missed Connections

Back at Cambridge in 1939, another young scholar and philosopher was also beginning his research at the university. After two years working under Alonso Church at the Institute for Advanced Study in Princeton, New Jersey, Alan Turing took up a position as an untenured research fellow at Cambridge, having failed to acquire a full lectureship. Turing and Wittgenstein had been introduced the summer of 1937, but it was not until two years later in 1939 that they would have any meaningful interaction. That spring Turing was also teaching a course on the foundations of mathematics that shared the same name as Wittgenstein's lecture.[viii] Perhaps intrigued, Turing enrolled. Over the course of the semester, Turing engaged in a lengthy dialogue with Wittgenstein, challenging and outright refusing much of Wittgenstein's thoughts on logic and mathematics.[ix] Despite their disagreement, this seems a pivotal moment in the history of computing, in which two queer figures engage with the limits of knowledge and

philosophy of mathematics. Now in his fifties, he denied outright there were any mathematical facts to be discovered. For Wittgenstein, a proof in mathematics does not establish the truth of a conclusion, but rather fixes the meaning of certain signs. That is, the "inexorability" of mathematics does not consist of certain knowledge of mathematical truths, but in the fact that mathematical propositions are *grammatical*, a kind of language game through which meaning becomes fixed. One the first day of class, Wittgenstein begins by stating, "I shall try and try again to show that what is called a mathematical *discovery* had much better be called a mathematical *invention*."[x]

The *Erkenntnis* from the Königsberg Congress of 1930

Throughout the semester, Wittgenstein attempts to demonstrate that, if we may identify a single contradiction within a system such as mathematics, it ceases to function and loses all meaning. In one particularly memorable exchange, Wittgenstein puts forth one of his favorite contradictions – known as Epimenides' paradox, or the liar's paradox – in which I make the claim "I am lying," thereby creating a paradox in which if I *am* lying I am telling the truth, and if I am *not* lying I am telling a lie. Such an example may seem like nothing more than a silly logic puzzle, but it is significant that they produce a paradox that cannot be made meaningful to mathematics, and that these contradictions exist outside of any functional or productive applications. This, of course, is an affront to the very practice of mathematical logic. As Andrew Hodges notes, "Getting statements free from contradictions is the very essence of mathematics. Turing perhaps thought Wittgenstein did not take seriously enough the unobvious and difficult questions that had arisen in the attempt to formalize mathematics; Wittgenstein thought Turing did not take seriously the question of why one should want to formalize mathematics at all."[xi]

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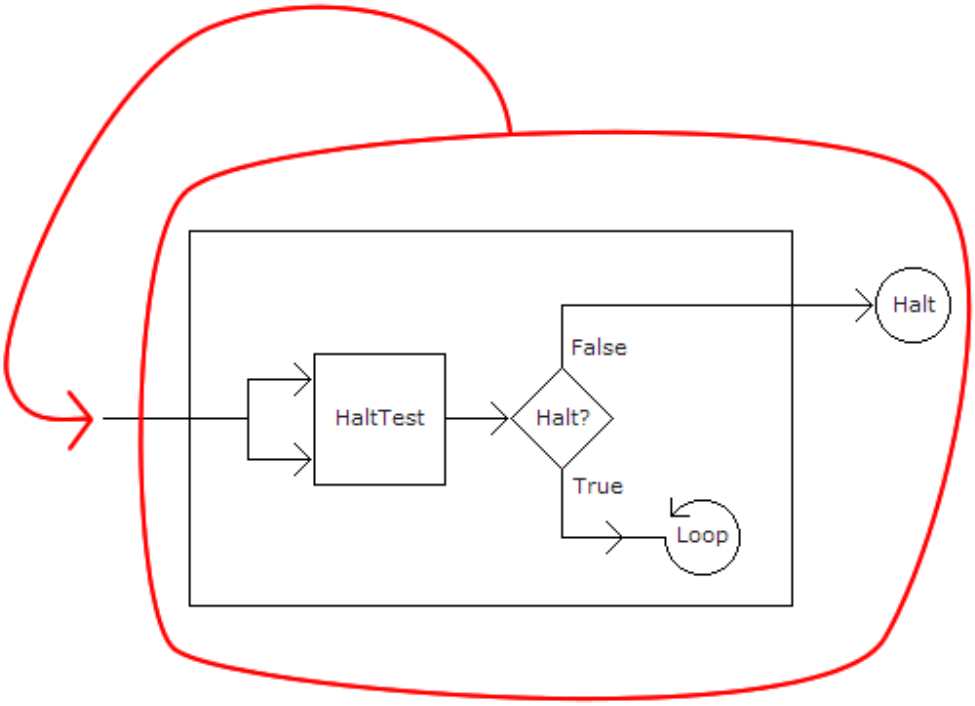
another; that their concerns and interests diverge on a fundamental level. On the whole, Turing argues for a rather conservative approach to mathematics and its use in material applications. Surely, Turing argues, mathematics must be more than language games, as it enables us to build bridges that do not fall down, and to calculate with great precision measurable truths in the world. Yet despite his philosophical refusal, Turing's own work and research during the three years prior to the lectures touches on many of the same themes Wittgenstein was pursuing in his lectures, and addresses those invisible or unknowable truths that escape mathematical calculation through computation. While the two are clearly are at odds over their importance, both are nonetheless explicitly preoccupied with these externalities, these meaningless contradictions.



Turing's most famous work on this subject is *On Computable Numbers*, published in 1936, in which he establishes the definition of computable numbers as "the real numbers whose expressions as a decimal are calculable by finite means," stating that "a number is computable if its decimal can be written down by a machine." Turing expands his thesis, proving that his formalism was sufficiently general to encompass anything that a human being could do when carrying out a definite method. Importantly, Turing also established in this work the limits of computation, identifying the existence of uncomputable problems that cannot be solved through a definite method.[xii] The most famous such problem is the halting problem, in which an algorithm is built to calculate whether a given program will halt and produce a solution, or run forever. If

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More interesting to this project, however, is a supplementary paper published in 1939, titled *Systems of Logic Based on Ordinals*, in which Turing asks if it is possible to formalize those actions of the mind that do not follow a definite method — mental actions we might call creative or original in nature. There exist certain sets of uncomputable problems which are functionally solvable by human means, but for which there is no definite method for calculating an answer. Here Turing suggests the impossibility of accounting for this intuitive action through computation, stating:

> *Mathematical reasoning may be regarded rather schematically as the combination of two faculties, which we may call intuition and ingenuity. The activity of the intuition consists in making spontaneous judgments which are not the result of conscious trains of reasoning.**[xiii]***

It is unclear how such intuition functions, or how to understand and successfully implement it, but Turing's biographer Andrew Hodges suggests that "the evidence is that at this time [Turing] was open to the idea that in moments of 'intuition' the mind appears to do something outside the scope of the Turing machine." That is, outside of computation as Turing has defined it.[xiv]

Outside

How then to bring together these two moments of the founding and formalization of computing? In one we have the refusal of the truth mathematics would hope to claim and an investigation of those contradictions that exist within, but are beyond the scope of logical inquiry. In the other there is an investigation of those exceptional sites and the suggestion that there is a process that exists beyond computation that nonetheless allows us to make truthful claims about the world. Two views on the same problem, and a seemingly impassible philosophical divide.

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For most historians of mathematics and technology, this encounter is viewed as a failure of recognition, and of the inability of Turing and Wittgenstein to reach across and make contact with one another on these fundamental questions. Much as it is unclear what one may have known about the other's sexuality, or if such similarities were even legible as a form of community or even commonality, there seems here to be a misrecognition, a failure to connect. And yet I would like to suggest that this is precisely the point, that this is precisely what makes this a queer encounter. It is the impossibility of narrativizing this encounter in legible terms, and the way in which this impossibility mirrors the indescribable, external truths that so preoccupied the minds of both men, that unites them. It is in these exceptional spaces outside of formally describable systems – binary code, language, mathematics – that we may identify a queerness at work.

In choosing this, perhaps the earliest moment at which such an inquiry is made possible, it seems meaningful that such questions are being posed by two queer men who met only briefly and, perhaps appropriately, were unable to come to an agreement, or to even understand the questions the other sought to answer. And yet each man's work seeks to investigate the limits of a particular system of knowledge that functions by delimiting the analog world through the construction of a hermetic system; one that rejects those externalities that might otherwise cause it to fail. If we consider queerness

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self-fashioning, then we begin to align it with these exceptional objects and practices that exist beyond the limits of a system such as computation. While it is no doubt true that queerness is not the only means by which we might ask these questions of technology, or through which we might seek an alternative to the universalizing structures of computing technology, it is my suggestion that is an ideal lens through which to examine that which exists outside or beyond, and one that begins here in these earliest moments in the history of computation.

Next segment: Part 3

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[i] W. W. Bartley III's *Wittgenstein* (1973) devotes 4-5 pages to the philosopher's sexuality, based on interviews conducted in the 1960s and translations of Wittgenstein's own encrypted journals – many of which were destroyed at his own insistence in 1950, a year before his death. Based on these passages the book was attacked vehemently and repeatedly by Wittgenstein's family and colleagues, in the pages of the *New York Times Literary Supplement*, and at the annual Wittgenstein Congress at the Wittgenstein Documentation Center in Kirchberg am Wechsel, Austria. The book was called sensationalist and false despite the availability of multiple documents corroborating Wittgenstein conflicted feeling towards his sexuality.

[ii] David Hume Pinset was a descendent of the philosopher David Hume, and was a friend and colleague to Wittgenstein, collaborating on research and traveling on holidays with him to Iceland and Norway. In 1918 Pinset was killed in a military flying accident, and Wittgenstein would later dedicate his *Tractatus Logico-Philosophicus* (1922) to his memory.

[iii] Monk, Ray. *Ludwig Wittgenstein: The Duty of Genius*. Free Press, 1990, pp. 583–586.

[iv] Duffy, Bruce. "The Do-it-Yourself Life of Ludwig Wittgenstein" *The New York Times* November 13, 1988. <http://www.nytimes.com/1988/11/13/books/the-do-it-yourself-life-of-ludwig-wittgenstein.html?pagewanted=all&src=pm>.

[v] Bartley: *Wittgenstein*, p. 47.

[vi] Delany, Samuel. *Times Square Red Times Square Blue*. New York: NYU Press, 2001 p. 123-124.

[vii] Wittgenstein, Ludwig. *Tractatus Logico-Philosophicus*. New York: Routledge,

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Cambridge, 1939 Ithaca, NY: Cornell University Press, 1976.

[ix] These encounters have been collected and recorded based on the notes of four students who attended the lecture, and were subsequently edited and published. As such they form an imperfect, but essential archive.

[x] Diamond, *Ibid.* 416.

[xi] Hodges, Andrew. "Alan Turing: One of the Great Philosophers" Web. <http://www.turing.org.uk/philosophy/ex4.html>.

[xii] Turing's work on uncomputability does not emerge from nowhere. It is informed by several decades of debate in the early history of mathematics – what is often referred to as the *foundational crisis of mathematics*, or *Grundlagenkrise der Mathematik* – over the question of whether mathematics had any foundation that could be stated within mathematics itself without suffering from irresolvable paradoxes. This led to competing schools of thought, the most important of which was Hilbert's program, named after the German mathematician David Hilbert. The program proposed to ground all existing theories to a finite, complete set of axioms, and provide a proof that these axioms were consistent. However, in 1931 Kurt Gödel's incompleteness theorems showed that any consistent system with a computable set of axioms which is capable of expressing arithmetic can never be complete, that it is possible to prove a statement to be true that cannot be derived from the formal rules of the system. Turing would take Gödel's work further, applying this theorem to the concept of computability, defined as that which can be stated within a formal system and may therefore be executed by a machine with a procedural grasp of computational logic.

[xiii] This train of thought belongs to a field in the philosophy of mathematics known as "intuitionism."

[xiv] To be clear, these externalities and paradoxes are not simply language games, but can be applied to real world problems as well. One famous example is that of Zeno's paradoxes, formulated by the Greek philosopher Zeno of Elea (ca. 490-430 BCE). In Zeno's dichotomy paradox, he states that "locomotion must arrive at the half-way stage before it arrives at the goal" (Aristotle, *Physics* VI:9, 239b10). In other words, if any possible finite distance may be divided in half, then in order to reach a given goal, a moving object must first get halfway there. Before it can get halfway there, it must get a quarter of the way there, before traveling a quarter it must travel one-eighth, and so on. The resulting solution requires the object to complete an infinite number of tasks, which Zeno maintains is an impossibility – yet clearly in the observable world objects move

time. The resulting hypothetical computer is often referred to as a Zeno machine, and is an example of a super-Turing machine – that is, a computer that functions beyond universal Turing computation. It is interesting to note that Zeno, like many Greek men, participated in homosexual *erastes-eromenos* mentor relationships, and was loved and mentored by Parmenides of Elea, the founder of the Eleatic school of philosophy.

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A Queer History of Computing: Part Three

By Jacob Gaboury

Apr 09, 2013

For the preceding segment of this four part geneology, see Part 2

In this third segment of our genealogy we begin to form a connection, and to examine those lesser-known but foundational figures that radiate out from Turing's early work. Perhaps appropriately, given the venue, this second figure leads us to one of the earliest examples of computational art ever produced, though he did not claim the title of artist for himself. This history also moves us forward to those pivotal years surrounding Turing's arrest and death. While Turing underwent a highly visible crisis, Christopher Strachey's work was coming into its own. Once again the connection is tenuous, and little record survives to document more than a passing relationship between these two men, but what remains is a surprisingly poetic attempt to play at the machine.

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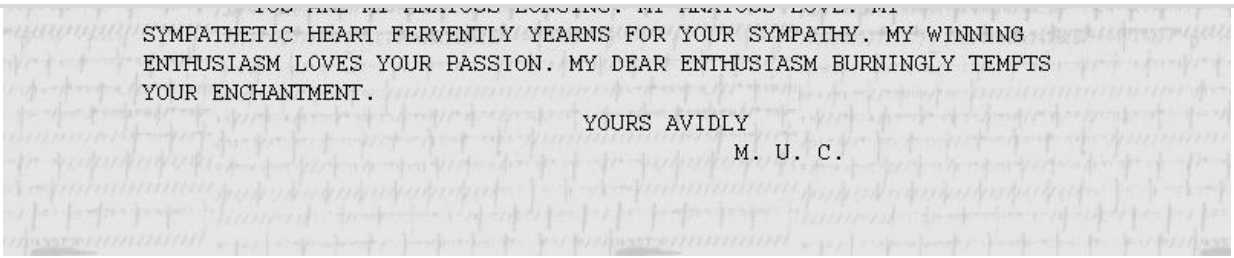
SYMPATHETIC HEART FERVENTLY YEARNS FOR YOUR SYMPATHY. MY WINNING
ENTHUSIASM LOVES YOUR PASSION. MY DEAR ENTHUSIASM BURNINGLY TEMPTS
YOUR ENCHANTMENT.

YOURS AVIDLY

M. U. C.

Christopher Strachey was born in 1916 in Hampstead, England to Oliver Strachey and Rachel (Ray) Costelloe.[i] The Strachey family may be familiar to some, as it has a long and distinguished history in England. Christopher's father Oliver served as an intelligence agent in the First World War and, along with Alan Turing, as a cryptographer at Bletchley Park in the World War II. Christopher's great-grandfather was Sir Henry Strachey, 1st Baronet, and the family has ties back to John Strachey, an associate of the philosopher John Locke.

Perhaps most well known is Christopher's uncle, Lytton Strachey who – along with Virginia Woolf, John Maynard Keynes, and E. M. Forster – was a member of the Bloomsbury Group, a widely influential group of writers and artists living in Bloomsbury, London in the first half of the twentieth century. Lytton is perhaps most famous for his biographical work *Eminent Victorians* (1918), which defied Victorian bibliographic norms through irreverent, comedic character assassinations of some of the most beloved moral figures of the Victorian era. The Bloomsbury Group is particularly famous for its modern views on feminism, pacifism, and sexuality. Much like Turing, Lytton was open about his homosexuality – at least between friends and other members of the Bloomsbury group – at a time when homosexuality was explicitly illegal. The Strachey family home was located at 51 Gordon Square, and Christopher would have grown up in the middle of the Bloomsbury group's most productive period.

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The Strachey home in Bloomsbury.

Appropriately, Christopher Strachey is also best known for a series of literary works. In 1952 Strachey developed a love-letter generator that ran on the Manchester Mark 1 using a random number generating algorithm, predating the ELIZA natural language processing program by twelve years. The project is considered by many to be the first example of algorithmic or computational art, though such claims are always highly contested. As a mathematician and computer scientist, Christopher Strachey was also one of the founders of denotational semantics and a pioneer in programming language design; yet this is not the path Strachey began on as a young man growing up in Bloomsbury among artists and intellectuals.

By most accounts Strachey was an extremely intelligent child but an altogether undistinguished student. Fascinated by puzzles and with a knack for mathematics and logic, he applied these talents only when it suited him, and wound up at King's College, Cambridge for his undergraduate education. While at King's college Strachey would first come in contact with Alan Turing, who was a junior research fellow at the university. According to Strachey's biographer the two met socially and not through what would become a mutual interest in computing, and as such it is unlikely that they discussed Turing's research on computability. As with the infamous Cambridge Apostles, of which Christopher's father and uncle had been members, King's College had a reputation for homosexuality and Marxist politics leading up to World War II. While Christopher was

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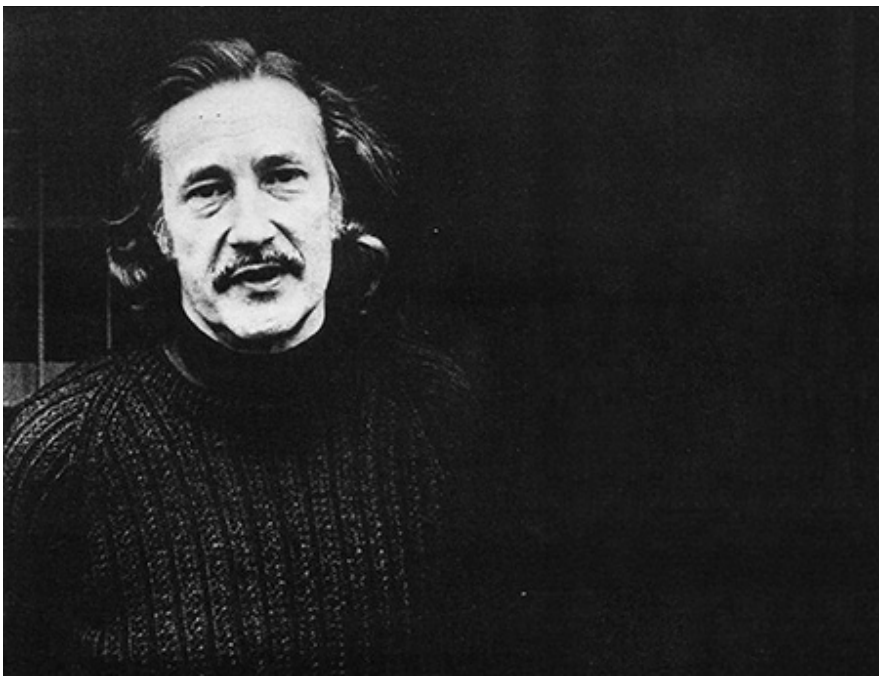

What little information exists on this episode comes from Strachey's sister. As Martin Campbell-Kelley notes in his brief biography of Strachey, "The reason for his breakdown is obscure, although his sister supposes it may have been a coming to terms with his homosexuality. At all events, he recovered, and the problem did not manifest itself as a breakdown again." The time away from school was spent partly in a residential home for psychotherapy – Christopher's uncle James was a prominent psychoanalyst credited with first translating Freud's works into English and penning his biography – and on vacation in the United States. This is the only explicit mention of Strachey's sexuality, or indeed any personal struggle he may have had with his identity, in any of the historical material I've been able to gather, aside from passing declarative statements that identify him as a homosexual. Again, the extent to which this breakdown functioned as a transformative moment in Strachey's life is unclear, as is the way in which his sexuality evolved and came to affect his life as an adult. Strachey would return to finish his education in the year following the episode, graduating with a disappointing "lower second" that dashed any hopes of a research studentship. Instead he would turn to education, and spent the next thirteen years at various educational institutions performing the role of schoolmaster.

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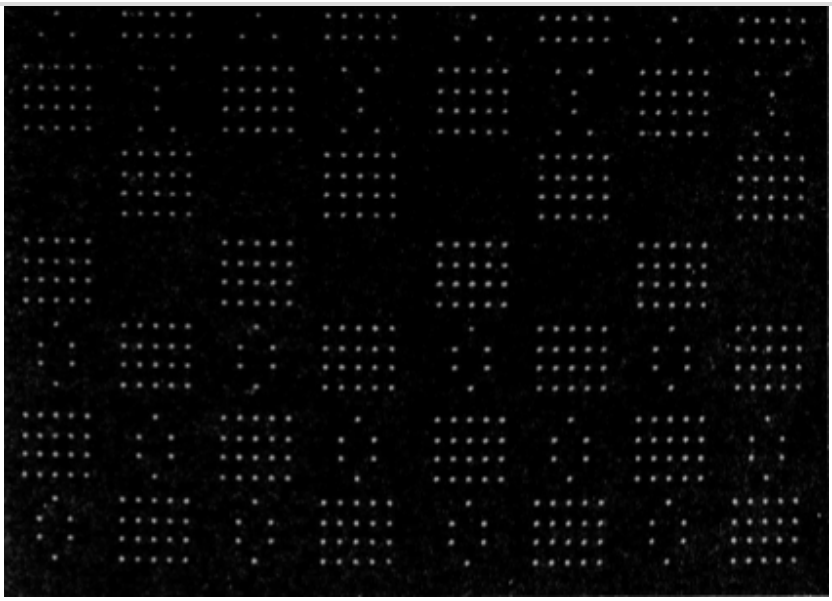

Strachey's draughts program.

Things began to change in January of 1951 when, through a mutual friend, Strachey received an introduction to Mike Woodger of the National Physical Laboratory (NPL). At that time the NPL was one of three institutions in the UK constructing computers – in this case the Pilot ACE, a preliminary version of the full Automatic Computing Engine or ACE, which had been designed by Alan Turing. Inspired by his visit, Strachey immediately began work on a program to make the Pilot ACE play draughts (checkers). He also worked on a program that would allow the machine to do its own coding, a self-reflexive gesture that reflected Strachey's interest in logical puzzles. The following spring he learned of the Ferranti Mark I computer at the University of Manchester, for which Alan Turing had written the manual. Through his earlier connections with Turing, Strachey managed to acquire a copy of the manual and began reprogramming his draughts program for the new machine.

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second visit he was given access to the Mark I to try out his program. Over the course of an intensive session that began in the early evening and lasted through the night, he was able to get the program mostly working, and on running to completion "it finished with a characteristic flourish by playing the national anthem on the 'hooter.'"[ii] In fact during his visit Strachey programmed the Mark I to play a number of songs, including "Baa Baa Black Sheep" and "In The Mood" - which were captured for BBC radio in the autumn of 1951. While his love letter generator would come the following year, and is perhaps more strictly a computational artwork, these tunes are considered to be one of the earliest examples of computer generated music, produced by a total novice and programmed in the course of one evening.[iii] The speed and ease with which Strachey appeared to work the Mark I cemented his reputation overnight, and he would soon become known as the man who wrote "perfect programs," which would lead to a job offer at the National Research and Development Corporation (NRDC) the following year.

Strachey's computer music, captured by the BBC in 1951.

In June of 1952, Strachey began his position at the NRDS. With a lack of projects to occupy him at the start of his employment, he kept himself busy by building his own programs to entertain himself. Then, beginning in August of 1953, short notes began appearing on the notice board of the Manchester University Computer Department. They appeared to be letters of love and adoration addressed to an unnamed, genderless other, signed only with the initials M.U.C.

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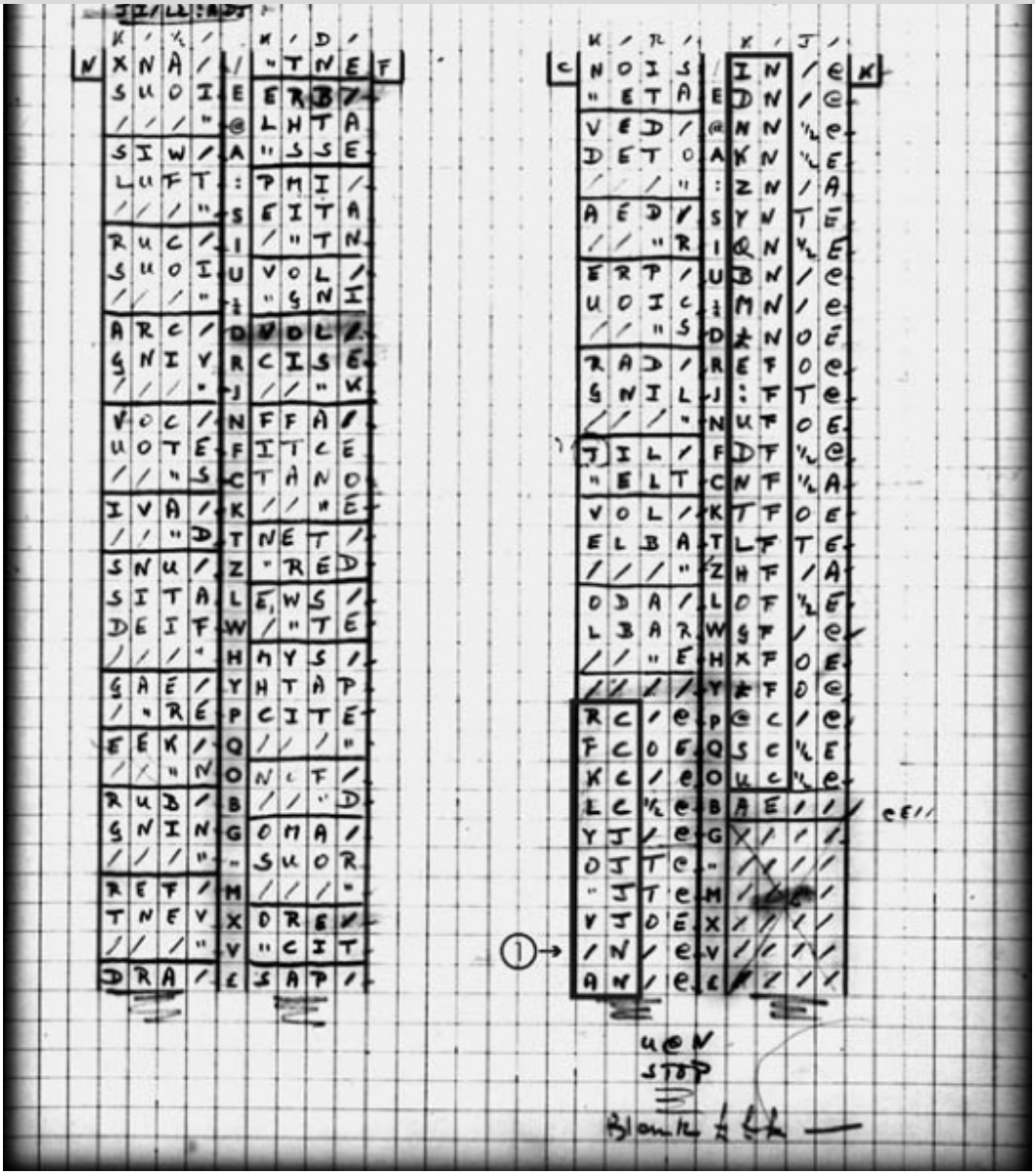

The list of adjectives in Strachey's love letter generator.[iv]

M.U.C., it turns out, stood for Manchester University Computer, and the letters were the product of an algorithmic generator that Strachey had written in his spare time. Each letter follows a similar structure, and is full of melodramatic Victorian overtones, with pet names like "honey," "jewel," and "moppet" along with other saccharine and yearnful descriptives. The letters were constructed via a generative algorithm that produced a variety of orders and combinations. In "There Must Be an Angel: On the Beginnings of the Arithmetics of Rays", David Link describes its execution in detail:

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("Rand"), follows one of two alternative paths. One generates a sentence following the syntactic skeleton "You are my—Adjective (adj)—Substantive (noun)"; the other path gives "My—[Adjective]—Sub- stantive—[Adverb (adv)]—Verb (verb)—Your—[Adjective]—Substantive" (the static words are underlined, the optional words are in square brackets). [...] Each phrase ends with a "Full stop". After the programme leaves the loop, it closes with the ending "Yours—Adverb (in the schematic this is given erroneously as 'Adj')—MUC."[v]

Previous scholarship by Andrew Hodges and others has suggested that the letters – surviving examples of which conspicuously lacked any variation of the word "love" – might have indicated a negotiation with the terms and legitimacy of desire, and a fascination with or alienation from love. More recent work done by David Link[vi] and Noah Wardrip-Fruin[vii] in the Strachey archives – in which the love letter generator is well documented – shows that in fact the original list of words that the computer could pull from via random number generation did include several variations on the word love, there simply were no examples of such letters in wide circulation.

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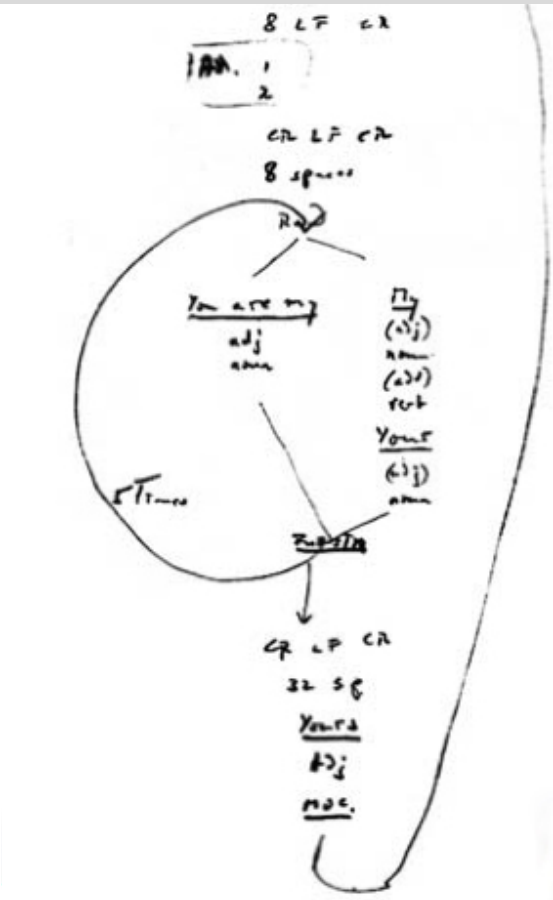

Schematic of Strachey's love letter program.

Rather than examine the love letter generator in terms of identity, Wardrip-Fruin chooses to view it as a literary project despite the mechanical, even comical tone of these letters. In other words, he attempts to analyze the process of the generator rather than the content of the letters, to understand the materiality of the technical object rather than the meaning of its output. This is a particularly interesting method, one that is especially valuable for the study of computational systems, which function through mechanical processes in which authorship is neither a privileged site to be investigated nor – as Roland Barthes so famously suggested – evacuated. Ultimately this turn suggests that, as Jeremy Douglass puts it in "Machine Writing and the Turing Test," "the true message of this love letter is 'this is a love letter'"[viii] - in other words, that the process by which this message is constructed and conveyed is of greater interest than the content of the message itself.

Ultimately Wardrip-Fruin concludes that the generator is "a process designed to fail that employs a thesaurus-based set of word data and that can result in particularly inhuman surface texts." Thus, "we can see the generator as a parody, though its operations, of

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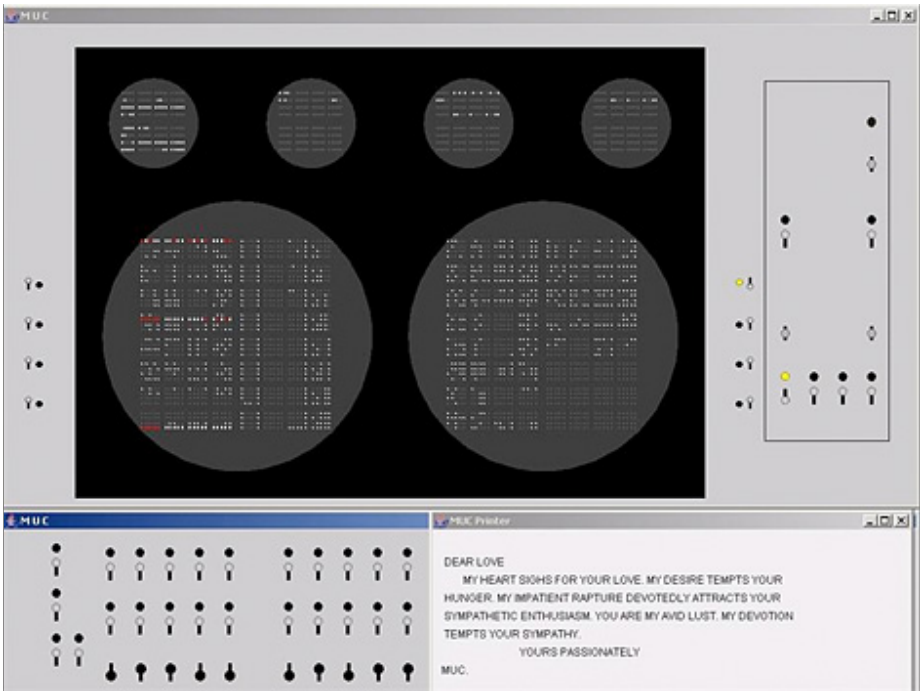
subtlety and complexity of, for example, the parody of Victorian morality played out by members of the Bloomsbury Group thirty-five years earlier, but this is not where the parody lies. Instead it is a parody of the process of producing love letters, of producing love through this highly formal yet deeply affective medium. It is in this sense a queer critique of normative expressions of love, enacted through a kind of generative, computational performance, through a purposefully deficient *simulation*.



The interface for artist-researcher David Link's recreation of the love letter generator.

In his biography of Alan Turing, Andrew Hodges writes of the love letter generator, that "[t]hose doing real men's jobs on the computer, concerned with optics or aerodynamics, thought [it] silly, but [...] it greatly amused Alan and Christopher."[x] It is interesting and perhaps appropriate that what might be considered the first work of computational art was a kind of joke, a critique of "real" epistolary writing and "real" love by means of automation through digitization. It is even more fascinating that it seems to have come from a queer history - not of "passing" as has been suggested with regards to Alan Turing's work on gender and artificial intelligence in the Turing Test, but of camp and the ostentatious performance of "authentic" affect.

Next segment: Part 4

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[i] The majority of biographical information on Strachey has been taken from Martin Campbell-Kelly's "Christopher Strachey, 1916-l975: A Biographical Note", published in

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[iii] According to the BBC, That honour goes to a third machine called CSIRAC, Australia's first digital computer, which "stunned" audiences with a rendition of Colonel Bogey. That said, no recordings of the CSIRAC music have thus far been found.

[iv] This image and the one that follows are taken from the Strachey archives and reproduced in David Link's essay, cited below.

[v] Link, David. "There Must Be an Angel: On The Beginnings of the Arithmetics of Rays" p. 20. <http://www.alpha60.de/research/muc/DavidLink_RadarAngels_EN.htm>

[vi] Link, David. *Ibid.*

[vii] Wardrip-Fruin, Noah. "Digital Media Archaeology: Interpreting Computational Processes" in *Media Archaeology: Approaches, Applications, and Implications.* Erkki Huhtamo and Jussi Parikka, eds. Berkeley: University of California Press, 2011.

[viii] Douglass, Jeremy. "Machine Writing and the Turing Test: From writing to writing system, in accordance with a queer theory of identity and a reception theory of art" <http://www.english.ucsb.edu/grad/student-pages/jdouglass/coursework/hyperliterature/turing/>.

[ix] Wardrip-Fruin, Noah. *Ibid*. p. 316

[x] Hodges, Andrew. *Alan Turing: The Enigma*. London: Vintage Books, 1992. p. 478.

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Comments

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A Queer History of Computing: Part Four

By Jacob Gaboury
May 06, 2013

In Part Four of our ongoing genealogy of queer computing (Part One, Part Two, Part Three), we introduce a second generation of queer scholars who made important contributions to the field of computer science, and from whom we may trace a direct connection back to those familiar foundational figures.

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memorial service was held for Professor Peter Landin. In attendance were his family and the friends whose lives he had touched over the last 78 years. It was a collision of worlds, a sudden mixing of two communities that Landin had kept separate his entire life. Landin's friend and colleague Olivier Danvy likened the event to the memorial for the French mathematical logician Jean van Heijenoort, author of *From Frege to Gödel* (1967).[1] In the early part of his life, van Heijenoort had been the personal secretary and bodyguard of Leon Trotsky, the famous Russian Marxist revolutionary and theorist, and the founder and first leader of the Red Army. Van Heijenoort left service only two months before Trotsky's murder in Mexico City by Stalinist assassins, but was a devout Trotskyist until his death, publishing extensively on his relationship with the revolutionary figure and editing a volume of Trotsky's correspondence before his own death in 1986. In attendance at van Heijenoort's funeral, Danvy recalls, were two disparate groups of people: on one side the logicians, and on the other the Trotskyists, each one incapable of communicating their own sense of importance of the man to the other.

Peter Landin had also led something of a double life. He was a foundational figure in computer science, and a pioneer of programming language design based on mathematical logic and the Lambda calculus. He was responsible for the invention of the first abstract process virtual machine—a kind of software emulator of a real world computer—ever defined. Many modern programming languages—such as JavaScript, the programming language that underpins much of the Web—make use of or fully rely on Landin's work on functional values, and have implementations based on his definition of a "closure," a programming function that “encloses” a set of variables so that it can be used in different contexts. Yet there was more to Peter Landin than this. All his life he had been a political radical, and since coming out in the 1970s he had been an active member of the Gay Liberation Front, protesting and campaigning on behalf of gay rights in the UK and abroad. His home on Rona Road in Camden had been a famous gay commune, and from the dinner parties he hosted many movements and collaborations were born.[2] And so on this Saturday afternoon two worlds met to commemorate his passing, and once again there seemed an impassable divide between these two parts of Peter Landin's life, these two worlds he simultaneously occupied.

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Landin was part of what we might describe as the second generation of influential queer figures in the field of computer science. This lineage is not simply chronological; there is a direct, genealogical connection between early foundational figures such as Alan Turing and Christopher Strachey, and those who lived through the pioneering gay rights movements of the 1960s and 1970s. The clearest queer lineage that begins with Alan Turing leads to Robin Gandy, his longtime friend and associate. Gandy first met Alan in 1939 as a student at Cambridge,[3] but they became particularly close when they were stationed together during the War and in the years following, and remained friends until Turing's death in 1954.[4] Gandy was never very explicit about his sexuality with friends and colleagues, but he and Turing seemed to share a mutual understanding and often discussed men and sex in a coded, joking way both in person and through correspondence. Landin shares a similar lineage with Christopher Strachey, having spent as brief period as Strachey's assistant after meeting in a bizarre set of circumstances that unite a number of key figures. Similarly, Landin spent a brief period as Christopher Strachey's assistant, the two having met in a bizarre set of circumstances that unite a number of key figures.

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Peter Landin was born in Sheffield, England on June 5, 1930, eleven years after Robin Gandy and eighteen years after Alan Turing. The only child of an accountant father who had been disabled in WWI, he was educated at King Edward's Grammar School. Later, at Clare College Cambridge he completed a mathematics degree in a rushed two years, and then attempted the very difficult Part III course, but came away with only a 3rd class degree. As Landin tells it, he was unsure of what to do with his life after college, which led him to a now-infamous group of early computer science pioneers:

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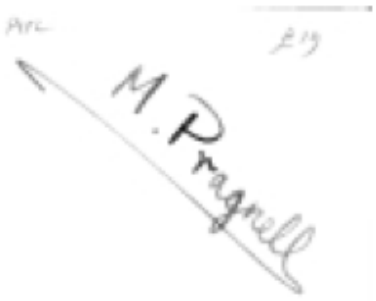
reference library trying to avoid making a decision about my life. I used to go out to a cafe just around the corner from this reference library … and one day I was having my coffee in Fields cafe, and a voice came booming across the crosswise tables, and this voice said "I say didn't I see you reading *Principia Mathematica*[5] in the reference library this morning?" And that's how I got to know the legendary Mervyn Pragnell who immediately tried to recruit me to his reading group.[6]

Mervyn Pragnell is the mysterious figure orchestrating many of these early connections. He is not only responsible for introducing many of these figures to one another, but also for introducing them to the lambda calculus of American mathematician and logician Alonso Church, which was essential to the development of a mathematical theory of computability. Not much is known about Mervyn Pragnell, as he does not appear to have ever held an academic post or published any research paper. Nonetheless, he was fascinated by mathematical logic in general, and Church's lambda calculus in particular. Much as with Landin, he was known for hanging around London bookshops approaching individuals he saw purchasing volumes on mathematical logic and recruiting them for a reading and discussion group. In an interview from 2000, Rod Burstall—one of many important logicians to get his start in Pragnell's groups – recalls that, while looking for a logic text in a London bookshop, he asked a man whether the shop had a copy. "I'm not a shop assistant," the man responded, and "stalked away," only to return to invite him to join the informal seminar where he would meet Peter Landin and, subsequently, Christopher Strachey.[7]



The sessions were held illicitly after-hours at Birkbeck College, University of London, without the knowledge or permission of the college authorities.[8] Pragnell knew a lab technician with a key that would let them in, and it was during these late night sessions that many famous computer scientists cut their theoretical teeth. This also appears to be the place Landin would first meet Strachey, and it marks the beginning of an important intellectual relationship between these two men. It is unclear how open either man was about his sexuality at the time—Landin, who identified as bisexual, would

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and development within the field.

Thus in 1960, nearly a decade after Strachey's love letter generator and six years after the death of Alan Turing, Peter Landin was taken on as a research assistant to Christopher Strachey, who at the time was an independent computing consultant working out of his home at 9 Bedford Gardens in Kensington. Having left the National Research and Development Corporation (NRDC), Strachey formally started activities as a private consultant on June 1, 1959. By 1960 he was fully occupied with a number of contracts, many of which he had begun while employed by the NRDC. Strachey took Landin on as a full-time employee specifically for a contract with the Ferranti electrical engineering and equipment firm, for whom he had agreed to deliver a scientific autocode – the term for a family of "simplified coding systems" or programming languages devised for early computers – for the company's new Orion computer. Landin set upon the project with great ambition, imagining an innovative compiler that functioned "as an automatic product of the semantics of the autocode, matching its forms to semantic representations of the instructions of the machine, and generating LISP expressions that could be executed."[9]

[9 Bedford Gardens, London]

While Landin was working for Strachey full time, he was not fully occupied by the Ferranti project, and with Strachey's encouragement he spent much of his time on a

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on the Ferranti project, or due to the overly ambitious and theoretical work Landin was attempting with his compiler, the work was never fully finished, and required additional work by Ferranti's own programming department to bring it into workable condition. Still, the research Landin began here with the support of Strachey was foundational to his study of programming languages. It allowed him to clarify his ideas about programming semantics and led to the publication of "The Mechanical Evaluation of Expressions" in 1964,[11] which showed how to translate programs into lambda calculus and defined the SECD machine, a landmark virtual and abstract machine that emulates a hardware environment within which lambda calculus expressions may be evaluated.[12] Landin hoped this work might form the basis of the design of future computers, and in many ways it has.

As Landin was conducting research and raising his children, a cultural shift had begun. In the US and Canada a transformation was underway. The former had seen the now infamous Stonewall Riots in Greenwich Village and the beginnings of a social movement for gay and lesbian rights. The Gay Liberation Front, or GLF, was formed by thirty-seven women and men who broke ranks with the conservative homophile establishment and urged a candlelight march in response to the riots. The GLF first took hold in the UK in 1970, growing rapidly over the next three years before splitting into a number of spin-off organizations such as the London Gay and Lesbian Switchboard, many of which still thrive today. In 1971 it issued a manifesto comprising a list of immediate demands, including the decriminalization of homosexual acts. While the law criminalizing homosexual activity that led to the arrest of Alan Turing had already been overturned by the Sexual Offenses act of 1967, that legislation set out explicit terms by which

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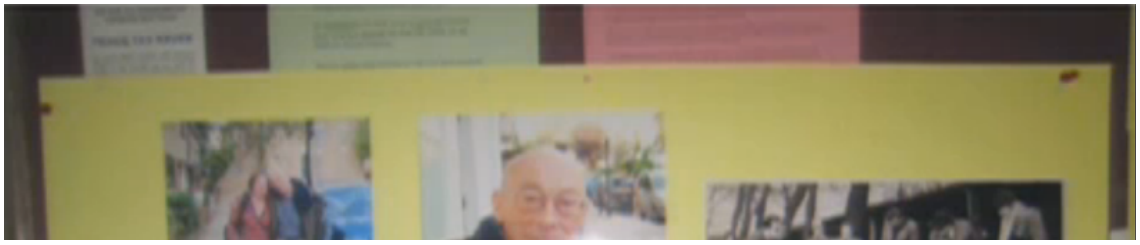
marks the beginning of a long legal battle that is still ongoing.

1970 would be a transformative year for Peter Landin as well. The previous ten years had truly shaped his career, but he was set to undergo a massive change. In 1964 Landin had ceased working for Christopher Strachey and, through contacts provided through their relationship, was "brain drained" to the US and—along with his wife and two small children children—he moved to New York City to work for Univac, then a major computer manufacturer. The family first took up residence in a hotel, but after asking for a home with a garden they were moved to a half-house in Greenwich Village. Landin published several key works during this time period, perhaps most famous among them a short work titled "The Next 700 Programming Languages" (1966), in which he gave a witty account of how all programming languages of the time were just sugared[13] versions of the lambda calculus.[14] By 1966, Landin was tired of the corporate world of New York City, and so moved with his family to Cambridge, MA to take up a teaching position at MIT. Still, he was disheartened by what he saw as a secretive environment that shunned collaboration, along with a group of colleagues with very different ideas about the logic of programming languages. And so in 1967 he was tempted back to London with the chair position at Queen Mary College, where he remained for the rest of his career.

Then suddenly, in 1970, Landin made the abrupt decision to walk out on the discipline of computer science. After serving as the evaluator on a student's PhD committee, he decided that the field had become too theoretical and retired. Having attained the position of full professor, he was given *emeritus* status and continued on in a reduced capacity at the university for the next forty years, but for Landin something had changed and he was no longer interested in the kind of innovative research that had occupied the previous fifteen years of his life. It was also during this time that Landin's personal life underwent a transformation. In 1973 he separated amicably from his wife, though he remained close to her and his children for the rest of his life. He was also becoming involved with the GLF and other burgeoning gay organizations, and was even arrested during a gay rights protest in London.[15] A regular on the lawn at Hampstead Heath, frequent dinner party host, collaborator, facilitator, and activist, Landin underwent a substantial transformation as he moved from one life into another.



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It is in this period that Peter Landin's life begins to recede from view. The archive fails, and forty years are devoured by the impassable partition that he erected between his personal and professional life. No doubt there exist many people who could share fond memories of Peter's activist years and his role as an organizer and friend, but these stories have not yet come to light.[16] Instead, it is his professional service and contacts that remain. What little that exists in the way of memorial and biography has been produced by university colleagues, and while it is currently unclear what will happen to Landin's papers, correspondence, and materials, too often in such cases these details are deemed "personal" and are either excluded or reserved until some future date. Toward the end of his life, Landin became "convinced that computing had been a bad idea, giving support to profit-taking corporate interests and a surveillance state, and that he had wasted his energies in promoting it."[17] It is perhaps unsurprising, then, that there exists almost nothing online about the last forty years of Landin's life and that, despite his influential role in the development of the field of computer science, Landin did not own a computer, a television, or a car.[18]

This is, in part, the reparative work that this essay hopes to accomplish. In linking the professional accomplishments of these men with those personal parts of their lives that even they may have deemed inappropriate for public discussion, my hope is to create a queer archive that links foundational developments in the history of computer science to explicitly queer figures and politics. It is, in part, a refusal of the separation of these worlds, and an acknowledgement of the way in which the sexual lives of these men are part of the historical significance of contemporary computational technologies. It's not that these facts have been hidden or are not known, it's that there is often a compulsion for historians to pass over them in silence. As with Landin, many of these figures have only recently passed away, and many others will be gone in the coming years. As a result, preserving these histories is of particular importance, as is producing an archive that reflects the complex divisions and connections that constitute these lives and this

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[1] Olivier Danvy, "In Memoriam Peter Landin," *Vimeo*.

[2] His colleague Richard Bornat notes in a commemorative article in the *Formal Aspects of Computing* journal, that "It was at one of his dinner parties that those who reinvigorated Gay Pride marches in the mid 80s met, just in time for the battle over clause 28" Richard Bornat, "Peter Landin: a computer scientist who inspired a generation, 5th June 1930 - 3rd June 2009," *Formal Aspects of Computing* (2009) 21: 394.

[3] The two met at a party in which Gandy was arguing in support of the Communist line in the Winter War between the Soviet Union and Finland. For many years Gandy was a member of the Communist Party, yet somehow escaped scrutiny even after the controversy surrounding the Cambridge Five, the group of Soviet spies believed to have been recruited through the Apostles society at Cambridge.

[4] Gandy was a mathematician and logician, but not technically a computer scientist. In this sense he does not neatly fit into this history, but as one of Alan's closest friends he was the strongest link to his life and work until his death in 1995. Moreover, while Gandy's work in mathematical logic was not explicitly in the field of computing, it should be clear by now that the fields share a common history and are very much aligned.

[5] *Principia Mathematica*, mentioned previously with regards to Turing, is a three-volume set of texts written by Alfred North Whitehead and Bertrand Russell, published in 1910, 1912, and 1913 respectively. It is an attempt to derive all mathematical truths from a well-defined set of axioms and inference rules in symbolic logic. It is widely considered to be one of the most important and seminal works in mathematical logic and philosophy.

[6] Peter Landin, Untitled talk at "Program Verification and Semantics: The Early Work," *BCS Computer Conservation Society Seminar*, Science Museum, London, UK, June 5, 2001.

[7] Donald MacKenzie, *Mechanizing Proof: Computing, Risk, and Trust,* (Cambridge: MIT Press, 2004), 273.

[8] Rod Burstall, "Christopher Strachey – Understanding Programming Languages," *Higher Order and Symbolic Computation* 13 (2000), 51.

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[11] Landin, P. J. 1964. "The mechanical evaluation of expressions." *Computer J. 6*, 4, 308-320.

[12] Bornat, *Ibid*., 394.

[13] The phrase "syntactic sugar" was also coined by Landin in 1964 to describe the surface syntax of A Programming Language (APL) which was defined semantically in terms of the applicative expressions of lambda calculus. It has come to refer to any syntax within a programming language that is designed to make things easier to read or to express, that is, it makes things "sweeter" for humans to use, even if they might be expressed more cleanly or succinctly in a number of alternate styles.

[14] The phrase "The Next 700…" has since been adopted as a kind of meme among computer scientists, spawning a number of speculative papers charting the future of a given field.

[15] Landin had previously been arrested while on a demonstration with the Committee of 100, the 1960s anti-war group founded by Bertrand Russell. He was sentenced Pentonville Prison, but only lasted a week before he became so bored that he paid the fine to be released. (via)

[16] In writing this piece I reached out to one of Peter Landin's children, but did not receive a response.

[17] Richard Bornat, Peter Landin Obituary, *The Guardian*, September 22, 2009.

[18] In fact, Peter Landin never learned how to drive. He was well known for biking everywhere he went, even into his old age.

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A Queer History of Computing, Part Five: Messages from the Unseen World

By Jacob Gaboury
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This marks the fifth and final installment in a genealogy of queer computing (Part One, Part Two, Part Three and Part Four).

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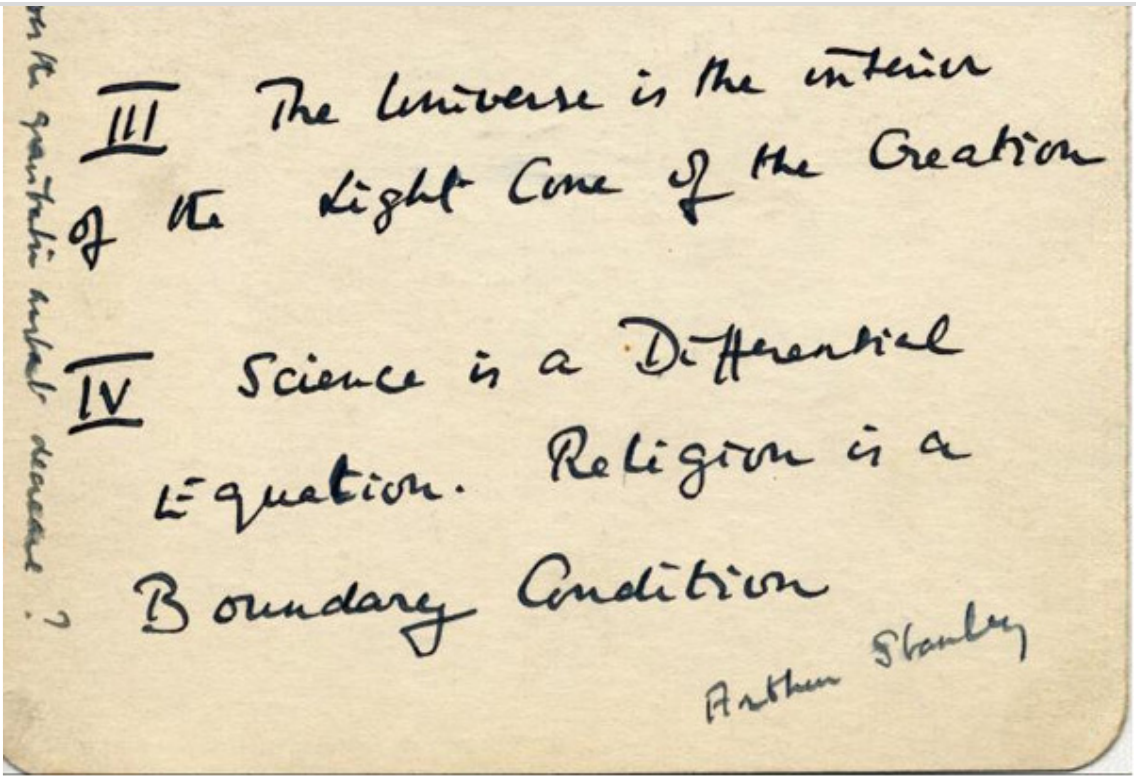

Note from Alan Turing to Robin Gandy, March 1954.

Born in London in 1949, Andrew Hodges attended Cambridge University from 1967 to 1971, where he trained as a mathematician. While there, he encountered the work of Alan Turing for the first time, learning of his significant contributions to the history of mathematical logic—though not of his homosexuality.

During his last year at university, Hodges came out openly as a gay man and became an organizer for the Campaign for Homosexual Equality (CHE), which continued the gay rights struggle after homosexuality was largely decriminalized under the Sexual Offences Act of 1967. Upon graduating he moved to London and became involved in the then-nascent Gay Liberation Front, where he met several other activists and co-authored a number of gay rights manifestos.

The first manifesto was a polemic against the treatment of homosexuality as a psychological disorder, authored anonymously with four other activists—Geoffrey Weeks, David Hutter, James Atkins, and Nick Firbank. Hutter was the long-term partner of Atkins, who had been Alan Turing's first lover from 1933 to 1937. It was during this collaboration that Hodges learned of Turing's sexuality and the role it played in his tragic death, as well as the psychological and chemical “treatment” he endured as part of his sentence for gross indecency. The story of these final years of Turing's life informed the writing of the manifesto; as it exemplified the tragic and inhumane treatment of gay men

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Self-Portrait by David Hutter ca. 1984.

Hodges' second book was even more ambitious. Co-authored with Hutter and written between April 1973 and April 1974 while Hodges was a graduate student in London, *With Downcast Gays: Aspects of Homosexual Self-Oppression* (1974) elaborated on the concept of self-oppression as a barrier to gay liberation (previously promulgated in the 1971 *Gay Liberation Front Manifesto*), stating that "The ultimate success of all forms of oppression is our self-oppression. Self-oppression is achieved when the gay person has adopted and internalized straight people's definition of what is good and bad."[1] Self-hatred was viewed as the means through which homosexual men and women were kept oppressed. Internalizing the idea that homosexuality is wrong, refusing to acknowledge existing oppression by heterosexual society, experiencing self-doubt at homosexual thoughts and actions and maintaining polite silence with regards to homosexual life are all means of self-oppression, which was seen as the primary barrier to forming a collective gay community capable of enacting radical change.[2]

A large section of the text is devoted to E. M. Forster, the famed English writer and, along with other familiar figures such as Lytton Strachey and Virginia Woolf, member of the Bloomsbury group. Titled "A Case in Point," the chapter deals with Forster's refusal to publicly acknowledge his sexuality publicly, portraying it as a shameful betrayal of his insistence on the value of freedom, individual commitment, and above all personal

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> betraying his country and betraying his friends, he hoped he would have the courage to betray his country. Since the choice was unlikely ever to be presented, this was an easy, if startling, claim to make. The real choice for Forster lay between damaging his reputation and betraying his fellow homosexuals. Alas, it was his reputation that he guarded and gay people whom he betrayed.[3]

This betrayal is made all the more jarring by the posthumous publication of *Maurice*, a novel written by Forster in 1914 with not only a homosexual theme, but a happy ending, something unheard of in most literary depictions of homosexuality at the time. The finished novel had been circulated among homosexual critics and friends of Forster for decades. The author's sexuality was an open secret, but no one would step forward to acknowledge its existence. Hodges and Hutter lament the damage that could have been prevented had he come out publicly later on in life**,** during that crucial, formative period for public opinion and critical legislature on gay rights. Even the earlier publication of *Maurice* could have done a great deal to upend the assumption that queer narratives and queer lives must ultimately end in a tragic death or suicide. "So readily does the gay community accept that homosexuality is a secret and individual matter that Forster took it for granted that his privileged status as the Grand Old (heterosexual) Man of English Letters would never be threatened by the public revelation of his homosexuality by any of those gay people who confidentially knew of it**,**" they wrote.[4]

E.M. Forster.

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It is in this moment that Hodges felt compelled to tell the story of Alan Turing, and in 1977 he began extensive research into all aspects of Turing's life. The resulting work, *Alan Turing: The Enigma*, was published in 1983, and it is the first public account of the full life of Alan Turing as both one of the most important figures of the 20th century and an openly gay man. It was a break from the culture of discretion that otherwise pervaded the polite society of homosexual self-oppression in the UK. For Hodges it was an attempt to move away from the compartmentalization of life, of the separation of the emotional from the technical. It was a conscious assertion that gay life, experience, and feeling should not be omitted from the writing of larger histories.

Matmos - The Unseen World

In March of 1954, three months before his death, Alan Turing sent four postcards to his friend and confidant, mathematician and logician Robin Gandy (discussed in Part Four of this series), labeled "Messages from the Unseen World." Cryptic and vague, they can be interpreted as coded messages regarding Turing's thoughts toward the development of physical cosmology, the origins of the universe, science, and religion. Some remain indecipherable, referring to some phrase or concept Turing never elaborated on. Each message is also quite beautiful, even poetic:

> III. The Universe is the interior
> of the Light Cone of the Creation.
>
> IV. Science is a Differential
> Equation. Religion is a
> Boundary Condition.
>
> V. Hyperboloids of wondrous Light
> Rolling for aye through Space and Time
> Harbour there Waves which somehow Might
> Play out God's holy pantomime.[5]

According to Hodges, "the reference to 'the unseen world' was a shared joke with Robin Gandy about the religious standpoint of the mathematical physicist and astronomer Arthur Eddington, whose book *The Nature of the Physical World* had started Alan Turing thinking about fundamental physical theory in 1930. It was a parody of the hymns of Sherborne School chapel, but perhaps also a serious reference back to his first wondering about mind and matter."[6] Whether intentional or not, the messages also seem to evoke the unseen world that Turing occupied and was only able to fully share in

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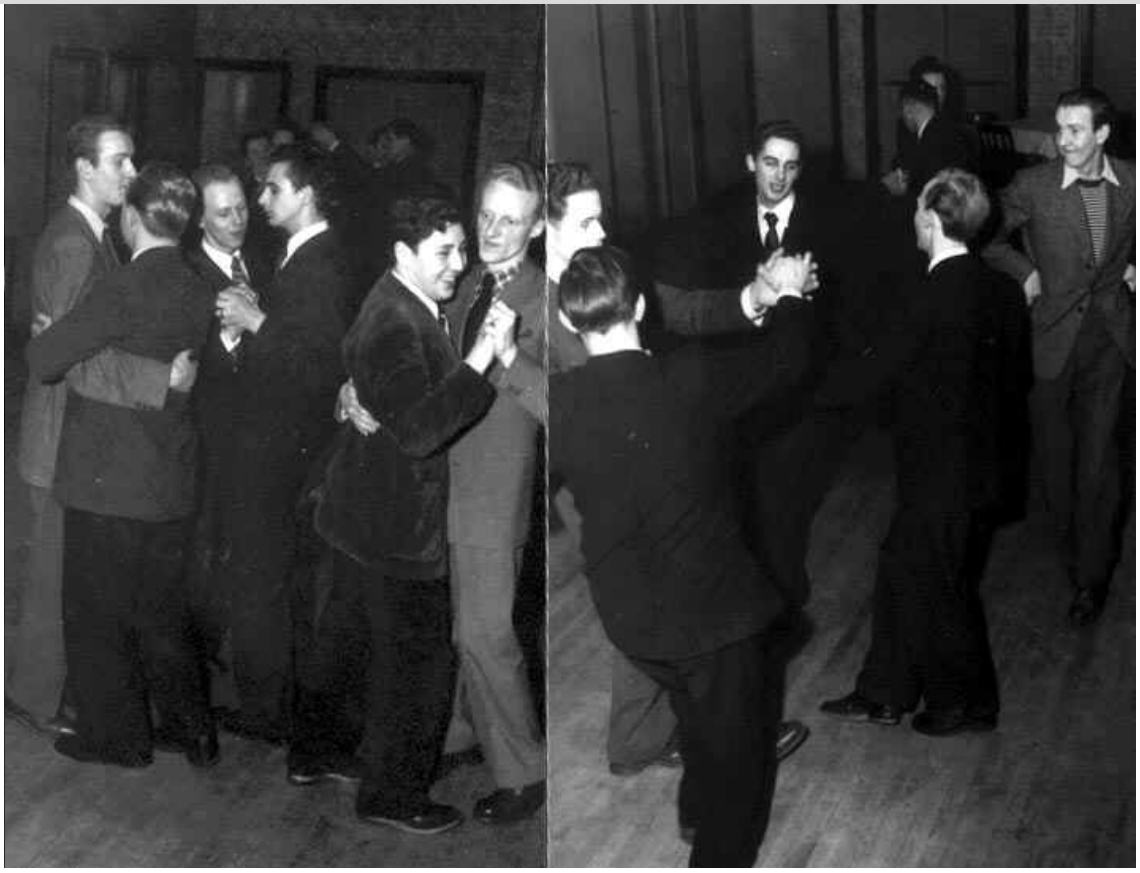

Photos of "for men only" dances in Norway, ca. 1952.

Far from being "unseen," Turing was under constant suspicion and surveillance by the police toward the end of his life. He was viewed as something of a security risk, particularly because he frequently traveled internationally to France and Scandinavia in search of a more open and tolerant environment. He had initially been attracted to Scandinavia after hearing rumors of dances taking place there "for men only," photos of which had been published in the local press. These were events organized by *Forbundet af 1948* or F-48, Denmark's first gay rights association founded on June 23, 1948. By the early 1950s the organization had expanded to over 1300 members and had chapters in Norway and Sweden.[7] Inspired, Turing became interested in learning Danish and Norwegian, and even met a young Norwegian man named Kjell, after whom he would name one of his final computer programs.

In March of 1953, Gandy was preparing to submit his PhD thesis in Cambridge, and made arrangements with Turing for its defense some time in April. Rather than write a response by hand, Turing typed a letter on the Manchester Mark I, the same machine used by Christopher Strachey as described in Part Three of this series. He printed it out, and posted it to Gandy. In it he notes that "Your last letter arrived in the middle of a crisis about 'Den Norske Gutt' so I have not been able to give my attention yet…" While

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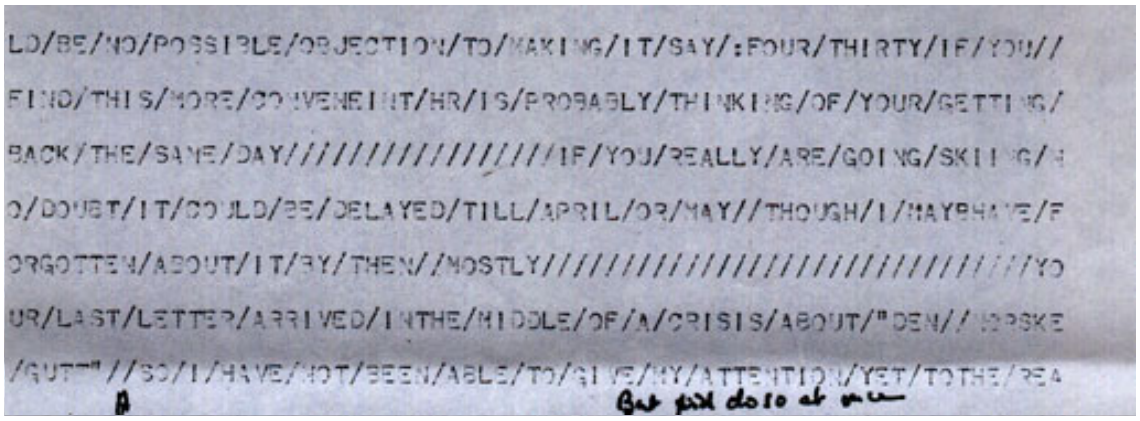
his home. In this context, the arrival of a foreign visitor was viewed as a potential security leak, and officers were deployed all over the North of England to intercept Kjell.[8] At this point in his life, Turing's accomplishments had become more of a burden than an asset, as his knowledge of the British nuclear program made him a high security risk. As such his movements and activities were closely monitored, and his relationship with the police ("the poor sweeties," as he called them) were increasingly frayed. Yet despite being deprived further access to government resources, and despite increasing surveillance and police suspicion, Turing seems to have continued working on a set of experimental ideas that, apart from a few allusions in letters to Gandy and others, are entirely lost.[9]



Message from Turing to Gandy, printed off the Manchester Mark I, ca. 1953.

Toward the end of his life, Turing decided to undergo Jungian analysis, writing down all his dreams in a series of three journals. Upon his death his psychiatrist Franz Greenbaum lent the books to his brother, John, as a means of clarifying Alan's mental state leading up to his suicide. John found the material deeply disturbing, particularly Alan's characterization of their mother and the descriptions of his homosexual experiences, beginning in adolescence.[10] The journals were destroyed shortly after being returned to Greenbaum.[11] Hodges describes a similar experience, of having viewed a document in 1978 in which Turing describes a number of men he met while vacationing in Corfu, Athens, and Paris in the summer of 1953, but which was subsequently destroyed by what he describes as "a censorious employee of the Atomic Weapons Research Establishment."[12]

This series is a tenuous history in no small part due to efforts to make it so through the removal of material from historical record, even when done with the presumed interests of the figures at hand. The exclusion of queer life from history often leads to its erasure and disappearance. As Ann Cvetkovich argues in *An Archive of Feelings* (2003), it is documents such as Turing's journals that demonstrate:

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document intimacy, sexuality, love, and activism, all areas of experience that are difficult to chronicle through the materials of a traditional archive. Moreover, gay and lesbian archives address the traumatic loss of history that has accompanied sexual life and the formation of sexual publics, and they assert the role of memory and affect in compensating for institutional neglect.[13]

The insistence on not only the importance but broad relevance of an affective sexual archive is fundamental to this history.[14] Thus, this is not a reinterpretation of history, or a queering of computation. Rather it is an insistence on the queer as it exists and has always existed within them.

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[1] Hodges, Andrew and David Hutter. *With Downcast Gays: Aspects of Homosexual Self-Oppression*. (1974) <http://www.outgay.co.uk/wdg1.html>

[2] It is surprising just how much of the text remains relevant and true forty decades later, and it is deserving of a much deeper analysis and historical framing with regards to gay rights movements in the UK in the 1970s.

[3] Hodges and Hutter (1974) < http://www.outgay.co.uk/wdg4.html>

[4] *Ibid*. (1974)

[5] Hodges (1992) p. 513

[6] Hodges (2000) <http://www.turing.org.uk/turing/scrapbook/wondrous.html>

[7] This openness would not last long, and in 1955 authorities cracked down on F-48 with arrests and show trials. Despite this the organization continued on, and in 1985 became the Danish National Association of Gays and Lesbians (*Landsforeningen for Bøsser og Lesbiske, Forbundet af 1948* or LBL).

[8] http://www.turing.org.uk/turing/scrapbook/wondrous.html

[9] There is a great deal of speculation on what Turing may have accomplished had his life not been cut so tragically short. See: Hodges, Andrews "What would Alan Turing have done after 1954?" Lecture at the Turing Day, Lausanne, 2002 <http://www.turing.org.uk/philosophy/lausanne.html > and Jack Copeland and Diane Proudfood "On Alan Turing's anticipation of connectionism" Synthese Volume 108,

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be-alive-today.html

[11] Hodges, 491.

[12] http://www.turing.org.uk/turing/scrapbook/wondrous.html

[13] Cvetkovich, Ann. *An Archive of Feelings: Trauma, Sexuality, and Lesbian Public Cultures*. Durham: Duke University Press (2003) p. 241.

[14] The relevance of such an archive can be seen in the way Turing's sexual relationships found their way into his programming work, as in the case of Kjell, and in the fact that his ideas often survive only through his correspondence with fellow queer colleagues, as in the case of Gandy. Yet in spite of the clear relevance of personal experience to broader technological developments, the archive of queer computing is often found to be troubling by its caretakers, who choose to bury, edit and destroy until this affective power is diminished.

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