# "Would I Had Him with Me Always"

## Affects of Longing in Early Artificial Intelligence

### By Elizabeth A. Wilson*

#### ABSTRACT

The science of artificial intelligence (AI) is not as unemotional as it might first appear. Not only are researchers in the field now taking an interest in how to program affective capacities into artificial agents; there is also plenty of historical evidence that concerns about affect have been present in AI from the earliest years. Examination of archival materials from the 1940s and 1950s shows that affects (particularly as they circulate between men) have been a significant part of innovation in AI from the beginning. This essay looks at one fragment of that history: the currents of affective and sexual interests in and around Walter Pitts, one of the important, eccentric, and little-written-about founders of AI.

IN A LETTER OF REFERENCE from 1946, the distinguished psychiatrist and neuro-physiologist Warren McCulloch writes glowingly of his young protégé, Walter Pitts: "He grasps details rapidly and is frequently first to formulate problems. . . . No theorist has done so much for us heretofore."[1] McCulloch and Pitts had been working together for a number of years at this time. Their 1943 paper "A Logical Calculus of the Ideas Immanent in Nervous Activity" was an important contribution to the newly emerging computational sciences, and it cemented Pitts's reputation as a critical figure in the early years of cybernetics and artificial intelligence (AI). By 1946 he was widely considered to be

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[1] Warren McCulloch to Professor Crane Brinton, Harvard Library, 1 Feb. 1946, Warren S. McCulloch Papers, American Philosophical Society, Philadelphia, BM139, Series I: Correspondence 1931–1968, Folder "Pitts, Walter." This collection contains a handful of letters from Pitts to McCulloch, and these have been important for the research in this article. See also Neil Smalheiser, "Walter Pitts," *Perspectives in Biology and Medicine*, 2000, *43*:217–226, which is based on interviews with Pitts's friends; and a recent biography of Norbert Wiener by Flo Conway and Jim Siegelman, *Dark Hero of the Information Age: In Search of Norbert Wiener, the Father of Cybernetics* (New York: Basic, 2004).

something of a polymath. Pitts had arrived at the University of Chicago in the late 1930s as a fifteen-year-old with an obscure background and a prodigious talent for mathematics and formal logic. "In my long life," McCulloch later wrote to the philosopher Rudolf Carnap, "I have never seen a man so erudite or so really practical." In a number of letters in the 1940s and 1950s, McCulloch speaks passionately of Pitts's talent. These letters not only make evident McCulloch's strong intellectual regard for Pitts; they also speak to the affective and interpersonal attachments that nurtured computational science in the immediate postwar period. In ways not always made clear in conventional histories of AI, personal and intellectual affections were intimately allied for these men. In his 1946 letter to Crane Brinton at Harvard Library, McCulloch declares: "I have known him [Pitts] well some four years as independent intellect, collaborator, personal friends and home-guest. . . . Humanly, as well as intellectually, he has become a charming companion. Men of Russell's age and wit find him congenial. To my children he is a second Lewis Carroll." He ends the letter with the slightly melancholic, particularly tender declaration, "Would I had him with me always."[2]

The emotional economy of the computational sciences has become more visible in recent years, as increasing numbers of practitioners in mainstream AI have turned their attention to building affective artificial agents.[3] Not only is it possible to program affective constraints into artificial agents, these researchers argue; it seems that emotional competence makes these agents more flexible, more robust, more *intelligent*—especially at the human/computer interface. Researchers in AI have explored how relations between artificial agents and humans become more dynamic when emotions (on both sides) are activated, modulated, and exchanged. This research emerged in conjunction with work in neuroscience and psychology in the mid-1990s that argued for the importance of emotional competence for cognitive proficiency: to put it colloquially, these researchers argued that one couldn't be intellectually smart without also being emotionally capable. In the light of this research, and after decades of neglect, the emotions once again became a viable object of scientific concern. As Lucy Suchman has noted, however, some of these researchers have conceptualized emotions in unnecessarily narrow cognitive terms.[4] There has been a tendency in mainstream AI to see emotion as a subset of cognition: as psychological expertise that can be built in the same kinds of ways one would build perceptual competency, or motor competency, or deductive competency. Moreover, artificial emotions are often seen as skills that are housed entirely inside an agent, rather than as capacities that are generated and regulated in relation with others. There has been a tendency to view emotions as individually owned chattels rather than as competencies that are developed between agents, over time. In this milieu, the intersubjective character of affect has received less attention than it needs in mainstream AI. The field of human-computer interaction (HCI), on the other hand, has embraced the intersubjectivity of

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[2] McCulloch to Rudolf Carnap, 15 Dec. 1955, McCulloch Papers, BM139, Series I: Correspondence 1931–1968, Folder "Pitts, Walter"; and McCulloch to Brinton, 1 Feb. 1946.

[3] See Cynthia Breazeal, *Designing Sociable Robots* (Cambridge, Mass.: MIT Press, 2002); and Rosalind Picard, *Affective Computing* (Cambridge, Mass.: MIT Press, 1997). Most literatures make important technical distinctions between "affect" and "emotion." Here, for the sake of brevity, I use the words interchangeably. My arguments about early AI are informed by Silvan Tomkins's affect theory: Silvan S. Tomkins, *Affect, Imagery, Consciousness*, Vols. 1–4 (New York: Springer, 1962–1991).

[4] Lucy Suchman, *Human-Machine Reconfigurations: Plans and Situated Action*, 2nd ed. (Cambridge: Cambridge Univ. Press, 2007). For the new scientific focus on emotions see esp. Antonio Damasio, *Descartes' Error: Emotion, Reason, and the Human Brain* (London: Picador; New York: Avon, 1994); and Daniel Goleman, *Emotional Intelligence: Why It Can Matter More Than IQ* (New York: Bantam, 1995).

emotion in innovative, sometimes startling, ways. Contemporary HCI projects like Kelly Dobson's affective domestic appliance Blendie, Natalie Jeremijenko's hacking of Sony AIBOS to make feral robotic dogs, Simon Penny's autonomous robotic artwork *Petit Mal*, Phoebe Sengers's Fear Reflector (a device that promotes reflection on fear during wilderness expeditions), Kerstin Dautenhahn's AuRoRA Project (which uses socially oriented robots as toys for therapeutic engagement with autistic children), and Ian Horswill's integration of contemporary attachment theory into AI have all offered new insights into how affectivity and artificiality may cohabit.[5]

In this essay, I argue that the cohabitation of affect and artificiality has been evident in AI from the very beginning. While it might seem that AI has only recently turned its attention to emotional concerns, close examination of historical documents shows that affect—in humans and in machines—has been a significant part of innovation in AI from the earliest years. Here I examine just one small fragment of this early history: the currents of affective and sexual interests in and around Walter Pitts. I use archival material about Pitts to show how affects circulate, intensify, and modulate between people, within groups, and around objects and knowledges, as well as within personal worlds. One innovates by feeling as much as by cognizing. Part of my concern, although I don't elaborate on this here, is that the differential weight that is put on feeling, pondering, affecting, and being affected determines the kinds of science, the kinds of objects, and the kinds of histories that are built. As researchers in AI and HCI turn to the emotions, it is important to look at the historical circulation of affect in the field and to examine the subtle differences in how the affects came to matter. Sexuality—how it is amplified or down-regulated by certain affective configurations—is an important part of that story.

McCulloch and Pitts's canonical 1943 paper "A Logical Calculus of the Ideas Immanent in Nervous Activity" was published in the *Bulletin of Mathematical Biophysics*. Pitts published a second article in the same issue of the journal; it follows immediately after the logical calculus paper and outlines a mathematical model of affective psychosis. The provenance and legitimacy of this second paper, cowritten with his great friend Jerome (Jerry) Lettvin, are unclear.[6] In a 1991 interview with Neil Smalheiser, Lettvin explained that from 1942 he had been a live-in resident at the Illinois Neuropsychiatric Institute. Pitts would "split his time between Lettvin's room, McCulloch's home, and his own shabby apartment in Hyde Park." Pitts spent enough time in Lettvin's company that the psycho-

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[5] See http://web.media.mit.edu/~monster/blendie (accessed 13 May 2009); http://www.nyu.edu/projects/xdesign/feralrobots (accessed 13 May 2009); http://www.ace.uci.edu/penny/works/petitmal.html (accessed 13 May 2009); http://cemcom.infosci.cornell.edu/mainsite/projects.php?pid=12 (accessed 13 May 2009); http://www.aurora-project.com (accessed 13 May 2009); and Ian Horswill, "Psychopathology, Narrative, and Cognitive Architecture (or, Why AI Characters Should Be Just as Screwed-Up as We Are)," in *AAAI Fall Symposium on Intelligent Narrative Technologies, Arlington VA, Nov 9–11, 2007*, pp. 49–54.

[6] Warren McCulloch and Walter Pitts, "A Logical Calculus of the Ideas Immanent in Nervous Activity," *Bulletin of Mathematical Biophysics*, 1943, 5:115–133; and Jerome Lettvin and Pitts, "A Mathematical Theory of the Affective Psychoses," *ibid.*, pp. 139–148. The paper on affective psychoses attempts a mathematical theory of certain severe psychotic states: the circular insanities (what would now be called bipolar disorder), reactive psychoses (brief psychotic episodes, usually triggered by trauma or severe stress), and some kinds of catatonia. It proposes that these states can be described by changes in two variables, "the first representing the level of feeling, affect, or emotion in the organism, and the other the level of activity or conation" (*ibid.*, p. 139). Aside from his published work, most of the available material about Pitts is anecdotal, and much of this has been supplied by Lettvin. See Lettvin, "Warren and Walter," in *Collected Works of Warren S. McCulloch*, ed. Rook McCulloch (Salinas, Calif.: Intersystems Publications, 1989), Vol. 2, pp. 514–529; Lettvin, "Jerome Y. Lettvin," in *Talking Nets: An Oral History of Neural Networks*, ed. James A. Anderson and Edward Rosenfeld (Cambridge, Mass.: MIT Press, 1998), pp. 1–21; and Lettvin, "Walter Pitts," in *The MIT Encyclopedia of the Cognitive Sciences*, ed. Robert A. Wilson and Frank C. Keil (Cambridge, Mass.: MIT Press, 1999), pp. 651–652.

analytic residents at the institute complained, accusing Lettvin and Pitts of a homosexual liaison. Lettvin claims that the affective psychosis paper was a facetious response to this charge: "Pitts's idea for revenge was to 'explain' that he and Lettvin had spent so much time together because they had been working on a brilliant scientific paper."[7]

There are a number of ways in which affect and sexuality and brilliant scientific work overlapped in Pitts's research environment. Much of his work was generated in situations where intensely affective relations between men were not simply commonplace—they were the means by which scientific business got done. Fruitful as these relations were, they nonetheless seem to have operated, I will argue, at the expense of more generous understandings of sociality and sexuality—and perhaps also at the expense of more complex understandings of artificial intelligence. I begin, then, with an interest in how a charge of homosexual affiliation could provoke not a denial, or a coming out, or an alteration of orientation but, rather, mathematical formulations of affective delirium. Was early AI affectively empty? Or were there pockets of affective-sexual intensity that have woven themselves into the very fabric of computational theory? What does computational science long for?

The early years of AI were shaped by strong libidinal and affective relations between men. In Alan Turing's case, in the United Kingdom in Cambridge and Manchester, this took the form of open and jovial homosexuality. Along the Chicago–Boston axis that was the backbone of Pitts's career, the bonds seem to have been primarily homosocial.[8] The friendship with Lettvin was perhaps the most intense of Pitts's peer relations. After shifting to Harvard to study neurology, Lettvin writes to Pitts and McCulloch back home in Chicago:

> I have had no adventures in Boston at all, save one very delightful afternoon with a drunken undertaker, and one pleasant evening with a confessed homosexual. . . . Walter, I wish you would come out here . . . because, sincerely I miss you more than anyone else, and frankly feel quite lost without someone whose friendship was more than mere nodding acquaintance. You are undoubtedly the best friend I ever had and it is acutely obvious that I cannot verbalize adequately what I feel without sounding trite or wishy-washy. If you can possibly make it out here I would be eternally grateful, because I have never been so lonesome as now.[9]

The attachment between Pitts and Lettvin began in Chicago (when they were both still teenagers) and continued after Lettvin shifted to Boston. They were reunited when Pitts also moved to Boston in 1943, at Lettvin's instigation. They later shared a one-room, twin-bed apartment in New York City (East 10th Street). On their return to Boston they lived with Hyman Minsky (the future economist) and Oliver Selfridge (another AI researcher) in a one-room apartment. Such sleeping arrangements weren't just for impoverished young students: this was affective-domestic business as usual for all these men. In a 1948 letter to Pitts that discusses arrangements for traveling to a conference, McCulloch

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[7] Smalheiser, "Walter Pitts" (cit. n. 1), p. 219.

[8] That is, these were relationships marked by intense attachment between men ("homo"), and through these bonds important cultural or epistemological spaces ("social") were made possible. "Homosociality" is usually defined in contradistinction to "homosexuality"; the implications of this distinction will be discussed further below. Here I am primarily interested in the affective bonds between the men, although as will become evident these bonds were not indifferent to, or unaffected by, certain sexual conventions. For more information on sexuality and Alan Turing see Andrew Hodges, *Alan Turing: The Enigma* (New York: Simon & Schuster, 1983).

[9] Jerry Lettvin to Warren McCulloch and Walter Pitts, Boston, n.d. (ca. 1942–1943, when Lettvin was studying neurology at Harvard), McCulloch Papers, BM139, Series I: Correspondence 1931–1968, Folder "Pitts, Walter."

says: "I understand we can get either a single or a double room in Pasadena. Shall I try for one for us together?" Likewise, when Norbert Wiener would come down to New York during the war, he would sleep in one of the beds at East 10th Street, while either Lettvin or Pitts took the couch.[10]

McCulloch and Wiener were both greatly attached to Pitts, and this attachment seems to have been cemented in large part by Pitts's youth. McCulloch's letters of reference for Pitts, for example, often emphasize not just his intellectual talents but also his age:

> It was your good fortune—and his—that you met him when he was scarcely more than a child finding his way to the core of science.

> Walter Pitts has been my collaborator since his 16th birthday.

> In spite of his extreme youth, the scope and power of his intellect is at once apparent in converse with men like Norbert Wiener and John von Neumann.[11]

Wiener also seems to have found Pitts's youth compelling. Pitts shifted to MIT after Wiener's protégé was killed in a mountaineering accident, leaving Wiener "desolate." Already in Boston, Lettvin seized the opportunity to promote Pitts: "I described Walter to him [Wiener], and he professed disbelief. So Warren and I got Walter on a train to Boston. Walter's meeting with Wiener at MIT was characteristic and beautiful." This traffic in young men was crucial to the establishment of the cybernetics group. "The boys" (Walter Pitts, Jerry Lettvin, Oliver Selfridge)—as they came to be known—did much of the intellectual and manual labor in Chicago and Boston. Pitts was also dispatched south to the Instituto Nacional de Cardiología in Mexico City to work on a cybernetic project under Arturo Rosenblueth. Both Wiener and McCulloch (the senior men in the group) appear to have been enlivened by the boys' intellectual enthusiasm, and it could be argued that they did their best work when closely attached to these young men. That is, the boys didn't simply supplement or support the labor of their elders (Wiener, McCulloch, von Neumann); these intergenerational alliances were vital to the emergence of cybernetics and AI as such. In his valuable history of this period, Steve Heims has characterized the relationships between Pitts and McCulloch and between Pitts and Wiener as paternal.[12] However, he offers no political commentary on such oedipalized professional bonds. Can such bonds be paternal without also being patriarchal (where, to put it bluntly, are the women?), and to what extent does the rubric of paternalism work to deflect the sexual quality of homosocial attachment?

[10] McCulloch to Pitts, 3 Sept. 1948, McCulloch Papers, BM139, Series III: Reminiscences of McCulloch 1968–1974, Box "Ka–V," Folder "Personal–W. Pitts"; and Lettvin, "Jerome Y. Lettvin" (cit. n. 6). Fifty years later, Lettvin spoke very fondly of their domestic arrangement in New York: "Now this [Walter shifting to MIT] was a wonderful thing. When Walter moves to work with Wiener everything is quite nice, except now I have to go off to the wars. After basic training in January of 1944, I have to report to New York, Bellevue Hospital, for a few months training in neuropsychiatry. Walter at this time is hired by Kellex Corporation [in New York], which is part of the Atomic Energy Project. They're over in the Woolworth Building, and so we move to New York together. We take a room together in the Village. He goes in the morning to Kellex, I go over to Bellevue, but meanwhile we're having a ball." *Ibid.*, p. 4.

[11] McCulloch to Carnap, 15 Dec. 1955 (cit. n. 2); McCulloch to Dr. Henry Allen Moe [John Simon Guggenheim Memorial Foundation], 30 Dec. 1959, McCulloch Papers, BM139, Series I: Correspondence 1931–1968, Folder "Pitts, Walter"; and McCulloch to Brinton, 1 Feb. 1946 (cit. n. 1).

[12] Lettvin, "Jerome Y. Lettvin" (cit. n. 6), p. 4 (Wiener "desolate"); Lettvin, "Warren and Walter" (cit. n. 6), p. 516 (promoting Pitts); Conway and Siegelman, *Dark Hero of the Information Age* (cit. n. 1) (Rosenblueth); and Steve Heims, *The Cybernetics Group* (Cambridge, Mass.: MIT Press, 1991).

Let me focus on the latter of these concerns—the way in which the libidinal aspects of homosociality are disavowed. Eve Kosofsky Sedgwick has argued that homosocial configurations of male friendship, mentoring, entitlement, and rivalry need to be understood in relation to male homosexuality itself.[13] Although it is characteristic of heteronormative organizations that they distinguish strictly between men-promoting-the-interests-of-men (homosociality) and men-loving-men (homosexuality), these lines are always usefully entangled. The story of how the young Pitts came to gain entry to the University of Chicago provides a clue to how a line between homosociality and homosexuality may have been more firmly drawn in Pitts's Chicago than in, say, Turing's Manchester. This story has been told many times. Manuel Blum gives one such version in McCulloch's posthumous collected works:

> Walter was just 15 then when he ran away from home, turned up in Chicago and there met a fellow who called himself Bert. Now, this Bert talked with Walter for some time of philosophy and mathematics, and came to realize that this was no ordinary youngster. Bert was impressed. He told the boy that Carnap, then Professor of Philosophy at the University of Chicago, had written a book that would interest him, and urged him to go and speak to the grand old man.

The "Bert" in this story is allegedly Bertrand Russell.[14] The story may well be apocryphal, but nonetheless it circulates as the shared tale of how Pitts came into contact with academic life. What seems clear is that Carnap was fascinated with Pitts, referring him to Nicholas Rashevsky's mathematics class, where Pitts met Lettvin, who introduced him to McCulloch. The homosociality of this trajectory is typical enough, even if it is marked by the queerness of Pitts's youth and working-class origins. I want to focus on one peculiarity in how this story has circulated. There is something more to be said about how this anecdote came to be published in McCulloch's collected works and so find its place in the history of AI. This additional detail is concerned with sexuality and the demand for a clear distinction between homosociality and homosexuality. Rook McCulloch (Warren's widow and the editor of his collected works) appears to have removed an element in this story that veers too close to manifest homosexuality. A copyedited manuscript of Blum's account reads as follows: "Walter was just 15 then when he ran away from home, turned up in Chicago and there, *in a park*, made friends with a fellow who called himself Bert." Blum's original phrase "in a park" has been deleted by hand in the copyedited manuscript. In another version of the same manuscript, the word "park" is deleted and the suggestion "small restaurant" is inserted.[15] The final published version of the story, as we have seen, mentions no particular location at all—as if the meeting of these mathematical minds were untouched by geographical orientation and, in particular, unsullied by the class, sexual, and gendered implications that meetings between men in public parks entail. This act of editing doesn't just erase any sexual frisson that may, or may not, have been part of the encounter; it also desexualizes the conceptual schemata that these men (Pitts, Russell, Carnap, Rashevsky, Lettvin, McCulloch) would build. It straightens out, and forswears,

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[13] Eve Kosofsky Sedgwick, *Between Men: English Literature and Male Homosocial Desire* (New York: Columbia Univ. Press, 1985).

[14] Manuel Blum, "Notes on McCulloch-Pitts' 'A Logical Calculus of the Ideas Immanent in Nervous Activity,'" in *Collected Works of Warren S. McCulloch*, ed. R. McCulloch (cit. n. 6), Vol. 1, pp. 339–340, on p. 339. On the identity of "Bert" see Smalheiser, "Walter Pitts" (cit. n. 1), p. 219.

[15] I italicized "in a park." Both manuscripts were held at the American Philosophical Society, Warren S. McCulloch Papers (BM139, Series IV: Reminiscences of McCulloch 1968–1974, Box 1 "A–D," Folder "Blum, Manuel") but have been removed. Copies are available from the author (Elizabeth A. Wilson).

the longing that motivates AI. The difference between a park and a restaurant, or between a park and no place at all, is the difference between a milieu grounded in carnal concerns and a milieu that considers itself wholly, chastely intellectual.[16] What Russell might find congenial in Pitts is now intellectuality of the most narrow, least inventive kind. Trivial though this editing gesture seems to be, it nonetheless sets in motion a series of powerful discursive engines: hetero/homo, private/public, natural/artificial, knowing/unknowing, mind/body. These discursive engines, I contend, will help establish what is conceivable, what is logical, and what can actually be engineered in the newly emerging computational sciences. The sexual and affective conventions that came to govern mainstream AI—the traditional aversion to affectivity, to sociality, and to sexuality in the simulation of human minds and the fabrication of artificial minds—didn't arise *ex nihilo*. These conventions were built out of small, seemingly tangential repudiations of the kind enacted by Mrs. McCulloch. From the beginning, sexual slights, emotional intensity, and artificial intelligence were mutually entangled, mutually consolidating.

The sociality of Pitts and his colleagues—the ways in which they met, worked, traveled, and collaborated—is coterminous with a certain mode of homosociality that stands in strong contrast to the homophilic homosociality of Turing's milieu. There is a fragment of a handwritten short story in the Turing papers at Kings College, Cambridge, that is more candid about the kinds of meetings that might happen between men in parks. Written by Turing, it narrates the exploits of a scientist, Alec Pryce, who is diverted from Christmas shopping for his mother in order to pick up a young man:

> It was quite some time now since he had "had" anyone, in fact not since he had met that soldier in Paris last summer. Now that his paper was finished he might justifiably admit that he had earned another young man, and he knew where he might find men who might be suitable. . . . Ron caught Alec's eye and gave him a half-hearted smile. It was enough though. . . . Alec approached the park seat; Ron made some room for him and he sat down. . . . "Got a fag?" he asked.[17]

For Turing, the relation between scientific work ("now that his paper was finished") and sexual encounter ("Got a fag?") was fairly direct, and indeed each seemed to enliven the other. I have argued elsewhere that one of Turing's talents was to get conventional discursive devices running athwart to their usual calibrations: imagination and engineering would lean on each other, thinking machines might roam the countryside, and private matters (buggery) would become public (burglary), raising the possibility that computational innovation and sexuality might be intimately coupled. It was in full knowledge of both the straightness of his epistemological context and the entanglement of sexuality and computational invention in his own life that, after his arrest on charges of gross indecency, Turing posed the following faulty syllogism: "Turing believes that machines think, Turing lies with men, Therefore machines do not think."[18]

While the McCullochs' house was a bastion of liberal thought, sexual interests appear

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[16] Lettvin, e.g., describes Pitts as "in a sense almost pure thought, thought personified": Lettvin, "Jerome Y. Lettvin" (cit. n. 6), p. 9.

[17] Alan Mathieson Turing Papers, Modern Archive Centre, Kings College, Cambridge, AMT A/13.

[18] In 1952, Turing was arrested on charges of sexual misconduct following the burglary of his house. In the documentary *The Strange Life and Death of Dr. Turing* (Christopher Sykes Productions, 1992), Shaun Wylie, one of Turing's colleagues, reports that Turing carried around the legal documents relating to his arrest in a folder entitled "Burglary & Buggery." See Elizabeth A. Wilson, "Imaginable Computers: Affects and Intelligence in Alan Turing," in *Prefiguring Cyberculture: An Intellectual History*, ed. Darren Tofts, Annemarie

to have been confined to conventional modes of heterosexual encounter and object choice. It is my concern that, in the same way that the inhibition of affect diminishes cognitive spaces, a homosociality that repudiates homosexuality is destined to generate weak models of interpersonal exchange. Sociality becomes dismally cognitive—the meeting of disembodied, affectless, asexual minds. In such circumstances, one might well end up (as Pitts did) in a marriage to abstract thought that was characterized not by enthusiasm and curiosity but by longing and melancholy.[19] Intelligence is likely to emerge from such arrangements similarly tempered: affectless, delibidinized, isolatable, dull. This kind of impoverishment is to be found in many mainstream affective AI projects: to the extent that they have modeled affect as an isolatable skill based in cognitive appraisal, they have been unable to overcome the historical inclination in their field for narrow (disembodied, individualized) understandings of intelligence. What is invigorating about many of the HCI projects, on the other hand, is their capacity to harness the intersubjective character of emotion and so amplify the ways in which affect and artificiality can co-evolve. The intelligence of their agents is often modest, but it is an intelligence that is alive to the importance of emotional reciprocity.

In the end, it was heterosexual anxieties that brought Pitts's social and intellectual world to a halt. In 1951, just a few months after McCulloch had shifted to MIT to work with Wiener, Pitts, Lettvin, and Selfridge, Wiener suddenly cut all ties with McCulloch and the boys. The reason for the estrangement was not entirely clear. Some thought it was a disagreement over intellectual issues; others indicated, somewhat vaguely, that personal (familial) demands had been involved.[20] The key issue—sexuality massively amplified by rage, as it turns out—was perhaps always known to the participants but has only recently been made public. Flo Conway and Jim Siegelman claim that Wiener's wife, paranoid in both professional and sexual matters, told Wiener that their daughter, Barbara, had been seduced by the boys when she was living in McCulloch's house in Chicago in the late 1940s. Without checking the veracity of this story, Wiener immediately and irrevocably relinquished his contact with the group. Pitts never recovered from the blow: "from that point on, we had no way of getting him interested in things." At the time he was working on his Ph.D. thesis (an analysis of neural nets connected in three dimensions) with Wiener. Pitts destroyed this manuscript, and when McCulloch later arranged for him to receive a Ph.D. on the basis of already published work he refused to sign the paperwork. Thoroughly drained of interest, Pitts retreated from social and intellectual engagement, spending large amounts of time alone, reading and drinking in bars: "He read incessantly and omnivorously, but stayed away from everyone. He read like someone waiting to die but willing to be distracted during the last hours."[21] In the late 1950s he was having seizures related to excessive drinking. One colleague recounts that in 1961 Pitts was so disabled by delirium tremens that he was unable to hold a conversation. When he died in 1969 from

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Jonson, and Alessio Cavallaro (Cambridge, Mass.: MIT Press, 2002), pp. 38–51, for an analysis of how these interests might be excavated from Turing's work. For the faulty syllogism see Turing Papers, AMT D/14a.

[19] This argument is pursued in more detail in Elizabeth A. Wilson, "Affect, Artificial Intelligence, and Internal Space," *Emotion, Space, and Society*, 2008, *1*:22–27. On the atmosphere at the McCullochs' house see Conway and Siegelman, *Dark Hero of the Information Age* (cit. n. 1).

[20] Michael Arbib, "Warren McCulloch's Search for the Logic of the Nervous System," *Perspect. Biol. Med.*, 2000, *43*:193–216; and Lettvin, "Walter Pitts" (cit. n. 6).

[21] Conway and Siegelman, *Dark Hero of the Information Age* (cit. n. 1); Lettvin, "Jerome Y. Lettvin" (cit. n. 6), p. 9; and Lettvin, "Warren and Walter" (cit. n. 6), p. 521.

bleeding esophageal varices, at the age of forty-six, he was alone in a boarding house in Cambridge.[22]

The confluence of sexual and intellectual matters—which in the 1943 affective psychosis paper had been enacted in the spirit of a prank—became toxic to the homosociality of the group and fatal to Pitts himself. The affective inclinations in the group were perhaps too muddled and too muffled to withstand the force of conventional patriarchal fury, and Pitts was too fragile and too isolated to recover from the intellectual and emotional shock. It may be tempting to read Lettvin and Pitts's 1943 paper on the mathematics of affective psychoses in a colloquially Freudian manner: it is the defensive reaction to an unconscious wish. Alternatively—and I think more usefully for a generous reading of the history of AI—the production of this paper could be read as an attempt to establish some kind of commerce between sexual, social, affective, and intellectual endeavor. The paper may well be facetious, but it is not therefore ineffective. The early history of AI seems more interesting, more compelling, more fertile if it is not simply the deliberation of affectless and asexual minds, but also the inchoate attempts of two young men to explain their keen intellectual and emotional attachment: would I had you with me always.

[22] Smalheiser, "Walter Pitts" (cit. n. 1); Arbib, "Warren McCulloch's Search for the Logic of the Nervous System" (cit. n. 20); and Lettvin, "Walter Pitts" (cit. n. 6).