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Article

Mortimer Taube's Critique of AI: Reflections for the History and Philosophy of Science and Technology

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Abstract:

This paper revisits Mortimer Taube's *Computers and Common Sense: The Myth of Thinking Machines* (1961), positioning his critique of artificial intelligence (AI) within the broader frameworks of the history and philosophy of science (HPS) and science and technology studies (STS). While often recognized for its relevance to early AI debates, Taube's work offers insights that extend beyond computing. He critiques the technocratic optimism present in many scientific fields, highlighting the tendency of scientific enterprises to overpromise and underdeliver. Taube explores how scientific legitimacy is constructed and the societal consequences of scientific overreach. This paper situates Taube's critique within philosophical debates on the limits of scientific authority and speculative claims. Additionally, Taube's ethical concerns about the misallocation of public resources toward speculative research are examined. His critique remains, therefore, relevant today, particularly in discussions around AI, quantum computing, and biotechnology, emphasizing the need for empirical rigor and ethical oversight. By situating Taube's work within broader mid-20th-century critiques of science and technology, this paper underscores its enduring value for understanding modern scientific challenges.

Keywords: Mortimer Taube; Artificial Intelligence (AI); Science; Technocratic Optimism; Scientific Legitimacy

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Introduction: Taube's Contribution Beyond AI

In 1961, Mortimer Taube published *Computers and Common Sense: The Myth of Thinking Machines*, a pointed critique that targeted the inflated expectations surrounding artificial intelligence (AI) (Taube 1963). While Taube's work has recently re-emerged in contemporary AI debates (Garvey 2021), its influence extends far beyond the realm of computing. His

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critique serves as a lens through which to scrutinize the perennial tensions between scientific aspirations and philosophical reflection, making him an essential figure in the history and philosophy of science (HPS) and science and technology studies (STS). This paper argues that Taube's insights remain relevant today, particularly in addressing the promises, limitations, and cultural dimensions of scientific practices.

Taube's central critique focuses on the technocratic optimism pervasive in AI and similar scientific fields, where proponents often conflate technological aspiration with scientific achievement. He warns against the tendency to overpromise and underdeliver —a dynamic that reverberates throughout the history of science and technology, from alchemical quests to contemporary genetic engineering. By foregrounding Taube's critique, this paper situates him within broader historical and philosophical traditions, including a reassessment of how science constructs its legitimacy.

In light of Taube's challenge to scientific overreach, it is crucial to revisit not only his work but also the evolving scholarly interpretations of his ideas. Recent scholarship by Garvey (2021) and Vieira and Karpinski (2024) underscores Taube's contribution to understanding the cultural and epistemological boundaries of machines and positioning him as a crucial interlocutor in modern STS scholarship. This paper builds on these discussions, examining Taube's critique of AI alongside his enduring influence on debates about the nature of scientific inquiry.

Taube's Biographical Context: Philosophy, Information Science, and Critique

Mortimer Taube (1910-1965) is primarily remembered for his contributions to library science, specifically his development of *Coordinate Indexing*, a precursor to modern information retrieval systems (Smith 1993; Garvey 2021; Vieira and Karpinski 2024). However, his philosophical training and deep engagement with methods of scientific inquiry positioned him to offer a more profound critique of AI and other emerging technologies. Taube's identity as a philosopher (Ph.D. in Philosophy from the University of California, Berkeley, 1935) and a librarian granted him a unique perspective on the limitations of mechanistic approaches to intelligence and knowledge. His critiques, particularly his sharp analysis of AI's conceptual underpinnings, can be viewed as an early intervention in what we now understand as STS. His broader insights into the cultural and philosophical dimensions of scientific inquiry place him squarely within the history of science.

Scientific Overreach and the General Problem Solver: A Microcosm

One of Taube's central critiques was aimed at the *General Problem Solver* (GPS), a program developed by Herbert Simon and Allen Newell that claimed it could simulate human problem-solving across multiple domains (Newell and Simon 1963). Taube dismantled these claims, arguing that the GPS's assertions represented an egregious example of scientific overreach (Garvey 2021). He highlighted the core issue in the GPS approach: it relied on abstract, rule-based algorithms that, while effective in controlled settings, were fundamentally disconnected from the nuanced, context-dependent ways humans solve problems.

In Taube's view, the GPS program was not just a failed attempt at replicating human cognition but a reflection of a larger pattern in the history of science. He drew parallels between the ambitions of AI and previous historical episodes, such as astrology's quest for legitimacy and the overly optimistic promises of early translation machines and simulations of human thinking. According to Taube, each of these moments demonstrated that scientific enthusiasm often outpaced empirical validation, leading to disillusionment and, in some cases, scientific stagnation.

By framing the GPS within this broader history of scientific overreach, Taube challenges the notion that technological progress is linear or inevitable. His critique encourages us to view AI's development with skepticism—not because technological innovation is undesirable, but because unchecked optimism can lead to exaggerated claims that undermine both the credibility of the field and its long-term success. This argument aligns with Vieira and Karpinski's (2024) recent reassessment of Taube, whom they argue foresaw the limitations of a purely mechanistic approach to intelligence long before these issues became widely acknowledged in AI discourse.

The Role of History in Science Critique

Taube's critique of AI, when examined through the lens of history, offers a compelling case study for understanding how scientific legitimacy is constructed, contested, and sustained. Historians such as Steven Shapin, Lorraine Daston, and Peter Galison have demonstrated that what is often presented as objective knowledge is, in fact, deeply shaped by cultural, institutional, and social factors (Shapin 1994; Daston and Galison 2007). Similarly, Taube exposes how AI proponents utilized rhetoric to secure public and institutional support, frequently by promising revolutionary breakthroughs that, as he warned, might not be empirically grounded. By emphasizing these rhetorical strategies, Taube's critique anticipates later debates about the social construction of scientific authority, drawing attention to the ways in which scientific fields leverage optimism and speculative ambition to establish their credibility. As Taube writes:

> This book has not been concerned with the evaluation of the work of individual scientists *per se*, but with present day aberrations of the scientific enterprise in general. It would be readily admitted by scientists that there were scientific aberrations in the past, namely, such enterprises as the science of alchemy or the science of phrenology. And it would be admitted that on the fringes of respectable scientific activity there are pseudo-sciences like astrology, dianetics, spiritualism, and numerology. But is the line between cloth and fringe so sharp? What about telepathy, parapsychology, and general semantics? And beyond these, what about psychoanalysis, the science of progressive education, or the science of public opinion polls, not to mention the science of hotel keeping and cosmetology? These questions are designed to indicate that neither public acceptance nor academic respectability is any guarantee of the soundness and legitimacy of a scientific enterprise. (Taube 1963, 122-123)

Linking Taube's analysis to these broader historical frameworks enriches our understanding of how scientific enterprises navigate the tension between empirical rigor and technological optimism. This tension is particularly relevant in fields like AI, where aspirational narratives often outpace actual achievements, leading to cycles of overpromise and underdelivery. Taube's work implicitly critiques the processes by which scientific authority is not just discovered, but actively constructed. By framing AI as an evolving field subject to these dynamics, Taube provides a crucial historical perspective that encourages deeper reflection on both the successes and the failures of scientific endeavors. His critique ultimately underscores the importance of maintaining critical scrutiny in the face of speculative technological promises, a lesson that resonates throughout the history of science and technology.

Comparing Taube with Philosophical Critiques of Science

Taube's skepticism toward the inflated promises of AI resonates strongly with Karl Popper's philosophy of science, particularly Popper's emphasis on falsifiability as a criterion for

scientific legitimacy (Popper 1959). According to Popper, a theory is scientific only if it can, in principle, be proven false; speculative claims that cannot be empirically tested do not meet this standard. Taube, in a similar vein, criticized AI researchers for positioning their field as scientifically rigorous while relying on theories that were largely untestable. In *Computers and Common Sense*, Taube argued that AI's bold claims about machine intelligence were based more on aspiration than on falsifiable, empirical evidence, leading to a situation where technological promises far exceeded actual achievements. More precisely, Taube's strong claim goes as follows:

> When reputable scientists begin to *accept* explanations merely on the basis that they *could* be true and that nothing *forbids* their being true, science becomes indistinguishable from superstition. (Taube 1963, 46–47)

Taube's critique also foreshadows Thomas Kuhn's paradigm-shift model (Kuhn 1962). Kuhn famously argued that scientific revolutions are often driven by social and institutional factors, as much as by empirical discoveries. Similarly, Taube revealed how AI, through its ambitious rhetoric, positioned itself as a revolutionary scientific field, even though its claims were still speculative. Like Kuhn's paradigms, AI seemed to gain legitimacy not from its proven results but from its promises of a transformative future. Taube warned that this social construction of AI's credibility risked misleading both the scientific community and the public. He identified a pattern in AI's evolution, akin to Kuhn's paradigm shifts, where an emerging field pushes the boundaries of existing scientific norms by appealing to the imagination rather than empirical success. This reflects a broader theme in the philosophy and history of science: that scientific legitimacy is often constructed through social dynamics, not just empirical validation (Fleck 2012; Hacking 1999; Hacking 2008).

Moreover, Taube's concerns about the dominance of unproven theories align closely with Paul Feyerabend's critique of scientific authority. Feyerabend argued that cultural and institutional pressures often allow certain theories to dominate scientific discourse, even when these theories lack solid empirical backing (Feyerabend 1975). He famously critiqued methodological monism, the belief that there is one "correct" scientific method that can guarantee objective truth. Taube echoed this sentiment in his critique of AI, warning that its proponents were prematurely declaring the advent of machine intelligence without adequate empirical evidence. As Taube observed, AI's reliance on speculative models over experimental validation mirrored the very methodological rigidity that Feyerabend criticized. Taube's work, therefore, fits comfortably within the larger tradition of philosophical skepticism toward speculative and overconfident scientific claims.

In addition to echoing Popper, Kuhn, and Feyerabend, Taube took a bold step by proposing that science should be subjected to the same level of criticism as the arts and religion. He argued that science, like literature and the arts, is a human endeavor and therefore susceptible to human errors, biases, and overreaches. Taube emphasized that science critics should approach their task with the same critical rigor applied to other fields:

> It [i.e., Taube's *Computers and Common Sense*] views the scientific enterprise as an activity carried out by men, not by demigods, nor even high priests. And just as the critics of literature or the arts are sometimes dismissed as sour, uncreative types, and critics of religious doctrine are dismissed as heretics, so the critics of science may expect to be pilloried and what is worse, disregarded. (Taube 1963, p. V)

This perspective anticipates more contemporary views in the sociology of science, which treat science as a socially and culturally constructed activity rather than a purely objective pursuit.

Taube not only critiqued AI but also laid the groundwork for a broader critique of scientific authority and methodology.

Ethical and Policy Implications of Taube's Critique

Taube's critique of AI not only challenges the scientific claims of its proponents but also raises profound ethical questions about the responsibilities of scientific communities, particularly regarding the use of public funds for speculative research. Taube was deeply concerned that the overpromising rhetoric surrounding AI could lead to a significant misallocation of resources, diverting public funds away from more pressing societal needs. His concern echoes modern debates on responsible innovation, where the ethical implications of emerging technologies are scrutinized in light of their potential societal impact.

Scholars in science and technology studies (STS), such as Sheila Jasanoff, have argued for a more accountable and reflexive approach to scientific research, one that aligns with societal values and addresses public concerns (Jasanoff 2016). Jasanoff emphasizes the importance of co-production—the idea that science and society are mutually constitutive—and suggests that scientific research should not merely advance technological frontiers but also engage with the ethical and social dimensions of innovation. In this context, Taube's critique can be seen as an early precursor to the call for responsible innovation. His insistence on empirical rigor and skepticism toward speculative technologies serves as a reminder that scientific endeavors must be held accountable to broader societal interests, rather than being driven solely by technological ambition or political and economic agendas.

Taube's critique resonates with contemporary concerns about the ethical dangers of pursuing large-scale scientific projects that prioritize technological ambition over tangible societal benefits. For example, the race for advancements in AI, quantum computing, and genetic engineering—all of which command significant public funding and political support—raises critical questions about the societal value of these investments. Taube warned that without adequate empirical grounding, such fields could lead to significant misdirection of resources, similar to the overenthusiastic investment in space exploration during the Cold War, which was often more motivated by political competition than scientific necessity.

In today's context, Taube's warnings are particularly salient. AI and other emerging technologies, such as quantum computing, receive vast amounts of public and private funding, yet their long-term societal benefits remain uncertain. Critics argue that these investments may lead to innovation without impact, where technological developments fail to translate into meaningful improvements for society, especially when measured against more immediate needs, such as addressing climate change, healthcare, and education. Taube's critique encourages a more cautious and measured approach to scientific funding, one that demands empirical validation and ethical oversight before large-scale investment is justified.

Furthermore, Taube's analysis aligns with broader concerns about technology-driven inequality. The development of AI, for instance, has been criticized for exacerbating socio-economic divides, as the benefits of technological innovation often accrue to the most privileged, while marginalized communities are left behind. Taube's emphasis on the need for ethical scrutiny of scientific projects suggests that scientific communities should take greater responsibility for ensuring that their work contributes to equitable outcomes rather than deepening existing inequalities.

All in all, Taube's critique of AI invites us to reflect on the ethical and policy implications of how we pursue scientific and technological innovation. His warning against speculative optimism—especially when it is funded by public resources—reinforces the need for responsible innovation frameworks, which prioritize societal benefits and ensure that

emerging technologies serve the public good. As Jasanoff (2016) has argued, this requires not only technical and empirical rigor but also a commitment to democratic governance and the inclusion of diverse voices in decision-making processes about science and technology.

Taube's Relevance to Modern Science and Technology Debates

The relevance of Taube's critique extends well beyond the early debates on AI, continuing to resonate in today's rapidly evolving technological landscape. As AI technology advances, with applications in machine learning, facial recognition, autonomous systems, and generative AI, Taube's warnings about the dangers of overpromising remain strikingly pertinent. The current discourse surrounding ethical AI and data privacy reflects the same concerns Taube raised more than half a century ago: that, in the rush to develop new technologies, the broader societal impacts—including privacy violations, algorithmic bias, and the erosion of public trust—are often overlooked or dismissed (O'Neil 2016; Zuboff 2019; Eubanks 2018).

For instance, debates over the ethical deployment of facial recognition technology illustrate the risks of overhyped technological solutions. While facial recognition is often promoted as a tool for improving security and efficiency, critics warn that its unregulated use can lead to significant infringements on civil liberties, including mass surveillance and discrimination against marginalized communities (Brayne 2020; Crawford 2021). These concerns mirror Taube's earlier warnings about AI, where he cautioned that the allure of technological progress could obscure the ethical consequences of deploying systems that are not fully understood or regulated. Taube's critique encourages us to question whether the societal benefits of these technologies truly justify their potential harms, especially when empirical evidence about their long-term impacts remains inconclusive (Taube 1963).

Similarly, emerging fields like quantum computing and genetic engineering face the same dangers of speculative hype that Taube identified in AI. Quantum computing, for example, is often heralded as a revolutionary breakthrough with the potential to solve complex problems in areas such as cryptography, materials science, and climate modeling (Preskill 2018). However, despite significant investment and media attention, quantum computing is still in its infancy, with many of its practical applications remaining theoretical (Arute et al. 2019). Taube's critique reminds us of the importance of maintaining a critical perspective on such technological claims, urging caution against accepting speculative promises as inevitable outcomes. Just as Taube cautioned against viewing early AI systems as fully realized thinking machines, we must remain vigilant against premature declarations of quantum computing's transformative potential until its capabilities are empirically demonstrated (Taube 1963).

Genetic engineering offers another example where Taube's critique remains relevant. The technology holds great promise for treating diseases, enhancing crops, and even tackling climate change (Doudna and Sternberg 2017). Yet, as with AI, the ethical and epistemological limitations of genetic engineering are often downplayed in favor of grand promises. The rise of CRISPR gene-editing technology, for example, has sparked significant excitement over its potential to cure genetic disorders, but it has also raised profound ethical questions about unintended consequences, such as off-target effects, ecological risks, and the potential for exacerbating social inequality (Jasanoff, Hurlbut and Saha 2015; Baylis 2019). Taube's critique of AI's speculative ambition serves as a cautionary framework for evaluating the promises of genetic engineering, urging scientists and policymakers to ensure that ethical considerations are not sidelined by the pursuit of technological innovation.

By revisiting Taube's critique, we gain valuable insights into the ongoing challenges of aligning scientific ambition with empirical rigor and societal accountability. In an era when

technologies like AI, quantum computing, and genetic engineering are frequently positioned as panaceas for complex global problems—ranging from healthcare to climate change—Taube's insistence on the need for rigorous empirical grounding and ethical oversight becomes increasingly relevant. His work serves as a reminder that scientific progress should not be driven by speculative hype or technological determinism but by a balanced consideration of empirical evidence, ethical responsibility, and societal needs.

Taube's enduring relevance lies in his ability to foresee the risks associated with unchecked technological enthusiasm. He calls for a more critical, reflective approach to scientific innovation—one that recognizes the limits of technology and the importance of maintaining public trust in the scientific enterprise. As we continue to grapple with the societal implications of emerging technologies, Taube's critique remains a crucial touchstone for ensuring that the pursuit of scientific progress is always tempered by ethical scrutiny and empirical accountability.

Contextualizing Taube within Broader Intellectual Traditions

Taube's critique of AI must be understood within the broader intellectual tradition of mid-20th century critiques of technocracy and the technological society. However, it is essential to acknowledge that *Computers and Common Sense* is the outcome of a scientist and intellectual trained in analytic philosophy and the problems of language, truth, meaning, and formalism in such a tradition. Taube's book engages with the philosophical issues raised by established authors such as Wittgenstein, Quine, Tarski, Bar Hillel and Chomsky. In contrast to formalists, who understand meaning by studying only certain aspects of reality and consider those aspects as reality itself, Taube proposed viewing meaning as a *continuum* that cannot be reduced to a number or a logical unit, as meaning primarily belongs to aesthetic experience rather than logical abstraction.

> The simple proposition, "this stone is grey," is not only the positive prehension of the characterization of a nexus of actual entities by a particular character selected from all those possible; but the very meaning of the proposition is infused with the negative prehensions of what the stone is not. Everyone recognizes the sense in which the extent of the penumbra of relevant meanings contributes to aesthetic experience, but one is apt to neglect backgrounds when one is concerned with the truth or falsity of particular propositions.
>
> In the last analysis, experience is primarily aesthetic, an affair of feeling and not logic. Logicians abstract from the matrix of experience and consider only certain formal relations of propositions and the sentences which express them. But [...] to take as the sole reality the result of an abstraction from a concrete process, is the basic error of formalism and one of the most widespread modern scientific aberrations. (Taube 1963, 116–117)

Further similarities with other 20th-century intellectuals can be traced. Prominent thinkers such as Jacques Ellul, in *The Technological Society*, warned of the dangers of unchecked technological development and the dehumanizing effects of automation (Ellul 1964). Ellul argued that technological progress, while often celebrated for its efficiency and innovation, posed a significant threat to human autonomy by imposing rigid systems of control that prioritized technological efficiency over human values. Like Ellul, Taube was concerned about the consequences of viewing technology—especially AI—as a solution to inherently human problems. Although based on different philosophical premises, in *Computers and Common*

Sense Taube cautioned that the mechanistic approach of AI oversimplified the complexities of human cognition, reducing rich intellectual processes to mere computation.

Similarly, C.P. Snow's famous *Two Cultures* debate (Snow 1959) underscored the growing divide between the sciences and the humanities—a division that Taube indirectly critiqued through his focus on the limitations of AI's purely mechanistic understanding of intelligence. Snow lamented that the split between scientific and literary intellectuals threatened to undermine society's ability to address complex global problems that required both technical expertise and moral reflection. Taube's work, with its philosophical underpinnings and emphasis on empirical rigor, can be seen as a call for a more integrated approach to knowledge. This approach balances technological development with a deeper understanding of humanistic values and ethical considerations. However, Taube's approach was rooted in analytical philosophy, and his critique of AI is grounded, as seen, in the philosophy of language, where language must be understood as a complex system that requires significant cognitive effort. Although Taube's work finds some resonance outside of the analytic tradition, he does not belong to humanistic movements; thus, it is important to remember that he was in contrast with the main humanistic movement of his time, the Chicago School. This intellectual strand also influenced Librarianship, the field in which Taube was professionally active, and was defended by influential librarians such as Lester Asheim, Lee Pierce Butler, and Jesse Shera (Vieira and Karpinski 2020).

Nevertheless, *cum grano salis*, Taube's critique of AI serves as an implicit contribution to the *Two Cultures* debate, advocating for a form of scientific inquiry that remains grounded in philosophical principles.

Taube's work reflects the broader cultural anxieties of his time, in which technology was perceived as both a promise and a threat to human values and societal well-being. The postwar period saw the rapid expansion of technological systems into nearly every aspect of life—from industrial automation to military applications—which fueled both optimism and fear about the future of humanity. Taube's concerns about overpromising and underdelivering resonate with the broader critique of technocratic control and the potential for technology to dehumanize modern life, a critique echoed by thinkers like Herbert Marcuse in *One-Dimensional Man* (Marcuse 1964), who warned of the ways in which technological rationality could suppress individual freedom and creativity.

By placing Taube's critique within this broader intellectual tradition, we can understand his work not only as a targeted criticism of AI but also as part of a larger conversation about the role of science and technology in shaping modern society. Like Ellul and Marcuse, though from different premises, Taube warned against the dangers of technological determinism—the belief that technology evolves according to its own logic, independent of social and cultural influences. His work urges us to remain vigilant against the overreach of technology and to recognize the limits of technological solutions in addressing the complex, human-centered challenges of modern life.

By contextualizing Taube within these broader debates, we can see his critique as more than just an isolated concern about AI's potential limitations. It is part of a broader intellectual and cultural effort to question the unchecked power of technology and to advocate for a more reflective, ethically responsible approach to scientific and technological development. Taube's work stands alongside these critiques as a reminder that technology should serve humanity—not the other way around.

Conclusion: Revisiting Taube's Legacy in Science Studies

As pointed out by Garvey (2021), the relevance of Mortimer Taube's critique to the field of AI was acknowledged by Taube's contemporary, the renowned Alvin M. Weinberg, Director of Oak Ridge National Laboratory. He agreed with Taube in observing that science should be

subjected to the same criticism of the arts. Garvey shares Weinsberg's hope that "Taube's critique would enjoy influence beyond AI" (Garvey 2021, 69).

This paper argued that Taube's *Computers and Common Sense* offers more than a critique of AI—it serves as a profound commentary on the culture of science itself. Taube's work remains highly relevant to scholars in the history and philosophy of science, providing a cautionary tale about the perils of uncritical optimism in the face of emerging technologies. His critique reminds us that science, for all its technical achievements, is a deeply human endeavor—one that is shaped not only by empirical discovery but also by ambition, ideology, and the broader social context.

As society continues to navigate the promises and pitfalls of fields such as AI, genetic engineering, and quantum computing, Taube's insights serve as a crucial reminder of the need for critical scrutiny. He warns against the allure of technological determinism and urges us to approach scientific advancements with a balanced view that recognizes both the potential and the limitations of innovation. Taube's critique extends beyond the specific debates of early AI, positioning him as a key figure in the history of science—one whose work challenges the dominant narratives of linear progress and technological triumph that often pervade scientific discourse. In fact, both in his time and ours,

> [...] the term "scientist" or "science" has taken on evaluative overtones and now means good scientist and important science. [...] a bad scientist, like a bad poet or a bad musician, is someone whose work is bad. There is bad science in just the same sense as there is bad poetry or bad music. There are thousands of scientists who are in science in just the same sense that other people are in religion, in politics, in music, in advertising, or in retailing. [...] The problem here is that the word has become an accolade, a laurel with which an enterprise is crowned and made good. (Taube 1963, 122-123)

On this account, Taube's legacy lies not just in his critique of AI, but in his broader contribution to how we understand the relationship between science, society, and technology. His work encourages us to question the narratives of progress that often go unchallenged, reminding us that the true advancement of science must be accompanied by ethical reflection, empirical rigor, and a deep consideration of its societal impact. In this way, Taube's critique remains a vital touchstone for contemporary discussions on the future of science and technology.

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