Peter Janich (Eric Hayot and Lea Pao, trans.)*, **What Is Information?** Minneapolis, MN: Minnesota University Press, 2018 (original German publication, 2006), 216 pp., $100.00 (hardcover), $25.00 (paperback).

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Although well known in his native Germany, the prolific philosopher of science Peter Janich has until recently been mostly overlooked in Anglo-American and Anglo-European media and science and technology studies (STS) scholarship. With their new translation of Janich's slim volume **What Is Information?** (originally published in 2006), Eric Hayot and Lea Pao have taken an important step toward correcting this absence. Breaking at speed into the vast discursive field that has developed around what Janich calls the "information-concept" (p. 43), *What Is Information?* lays out a sustained philosophical critique of the pervasive notion that information constitutes a natural-scientific object. So constructed (or, as Janich tells it, so mythologized), information sheds its human and social history, appearing in the world not as the *product* of scientific practice but instead as one of its proper objects. In Janich's account, information takes on the cast of the fetish, "something to be carried aloft like the plaster figure of a saint in an Easter parade" (p. 4).
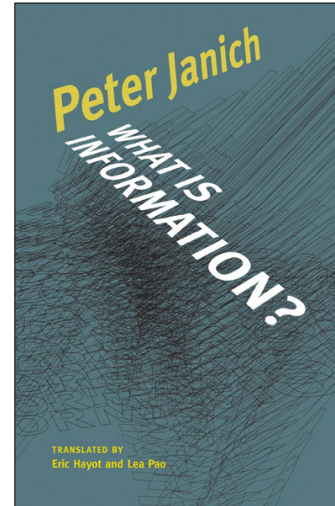
While the balance of Janich's critique descends primarily on cybernetics and information theory, he also helpfully locates the naturalization of information within a longer history of epistemic and disciplinary transformation, paying particular mind to 19th- and early 20th-century efforts to cleave the natural sciences from philosophy, and to assimilate the former to the "queen discipline" of physics (p. 12). On this score, Janich fingers three main culprits. The first is Heinrich Hertz, who, Janich argues, "naturalized the natural sciences" by presuming a "physical correspondence between mind and reality" (p. 20) that rendered Nature, as such, empirically knowable. Second is David Hilbert, who "formalized theory" (p. 21) by cleaving mathematics from any measure of validity other than its own "logical consistency" (p. 22). Third and finally, Janich sets his crosshairs on the whole line of engineers extending from Johann Philipp Reis and Alexander Graham Bell to the technicians at Bell Laboratories who, together, "mechanized communication" by propagating the notion "that communication can be causally managed according to physical laws" (p. 27). Subject to this three-pronged assault, information, once a "literal and metaphysical discourse about the relation between *form* and *content* . . . became . . . a program for the *explanation* of content (perception, thought) by form (the material medium)" (p. 12, emphasis in original).

Suffused with an acerbic wit, Janich's dissection of these overlapping trajectories proceeds both methodically and polemically, at each turn framing the information concept as an emphatically human invention, explainable in terms of the ordinariness of scientific practice. Together, chapters 1 and 2 lay out the history I have briefly sketched above, tracing the emergence of the information myth in the 17th century, its consolidation as scientific common sense in the late 19th, and its proliferation in the 20th and

21st. Having established these historical and intellectual foundations, Janich in chapter three homes in on what he (almost giddily) describes as the three "articles of scientific faith" that anchor the contemporary information myth. Here, *What Is Information?* tacks toward questions that will be familiar to historians of information theory, cybernetics, and related fields. Article of faith number one, for instance, is Claude Shannon's well-known choice to define information as a nonsemantic quantity, and thus to separate it from the whole field of meaning and interpretation. What enlivens this otherwise well-traveled analytic trajectory, however, is Janich's willingness to venture beyond the history of communications engineering. Specifically, he tracks the coherence of the Shannon/Weaver information concept with Charles Morris's *Foundations of the Theory of Signs,* which antedates *The Mathematical Theory of Communication* by a decade (Morris, 1938). Morris's semiotics, which differentiates between the semantic, pragmatic, and syntactic dimensions of semiosis only to privilege the latter (or so Janich argues) establishes a normative theory of communication that begins with the syntactical ordering of empty forms and only later terminates in the world of human affairs and intentions. "The consequences of this theory," Janich asserts, "will come to fruition in the Shannon-Weaver theory" (p. 38). Although historiographically tenuous, this remains a provocative argument, suggestive of an alternative genealogy for structuralist semiotics and cybernetics alike, one in which the two fields not only co-found but continually refashion one another over the course of the 20th century. Janich's second and third articles of faith run a bit more straightforwardly. Article two consists of the elevation of the feedback mechanism to the status of a generalized principle of order and organization, while article three consists of the "sleight of hand of conceptual labeling" that smuggles the thermodynamic concept of entropy into information science, stamping the latter "with all the objective authority of physics" (p. 31).

What follows in chapter 4 is a deft unpacking of the ways in which these articles circulate in the contemporary sciences (genetics, neurophysiology, and molecular biology, in particular, come in for sustained critique), most often in the guise of what Janich calls the "telecommunications paradigm," which holds that "only the coding and decoding function under noisy conditions count as the matter of the message" (p. 65). Finally, Janich concludes the argument with a fifth chapter dedicated to what he calls "methodical repair work" (p. 127). By way of a substantive engagement with speech act theory and the philosophy of language, Janich here seeks to develop a new kind of information concept, one that *begins* from the pragmatic and semantically freighted world of human thought and action. What Janich ultimately offers here is a great tidying up of names, metaphors, and categories—a restoration of communication to its "proper" station in the realm of human affairs, and a simultaneous turning of the telecommunications paradigm back toward the description of specifically technical systems.

Much of this trajectory will prove familiar, though still clarifying, for those acquainted with the core themes of science and technology studies, the philosophy of science, and media studies. Indeed, in Janich's early critique of Galileo, one can discern the basic outlines of the STS program writ large. Aping the narrative template of original sin, Janich writes,

> The rise of mechanical observation and measurement . . . and of real-world experimentation . . . constitutes a major sign of this transformation. Already there we can see the first steps toward a philosophical catastrophe: Galileo mistakes the

> operations and functions of his experimental machinery for the actions, and laws, of
> nature itself. (p. 18)

Such critiques will find sympathy with those in and beyond STS who insist on the irreducibly social and cultural character of (techno)scientific practice, on grappling with the doctrinal ideology of what Daston and Galison (1992) call "mechanical objectivity" (p. 82), and on lodging the scientific firmly within a universe saturated with questions of meaning, value, and interpretation.

And yet, however familiar its references (and targets), as Hayot and Pao note in their helpful translators' introduction, *What Is Information?* also cuts a strange path across its chosen terrain, emerging from a philosophical tradition that never once collides with such seemingly obvious points of reference as Friedrich Kittler (1997), Vilém Flusser (2002), or Claus Pias (2003; 2004), and that altogether bypasses the substantial body of English-language cybernetic historiography and critique developed by the likes of Geof Bowker (1993) and N. Katherine Hayles (1999). As Hayot and Pao (2018) summarize, the critique "takes place almost entirely within German-language philosophy of science. [Janich's] major intellectual touchstones lie exclusively in the German philosophical tradition leading up to the work of Immanuel Kant" (p. xvii) with the majority of his 20th century references drawn from the ranks of the "pre- and post-Vienna Circle group of thinkers who launched the fields of analytic philosophy and philosophy of science" (p. xvii). Moreover, it unfolds by way of a likely unfamiliar method of analysis known as "methodical constructivism" (p. xiii), which attempts to build an understanding of science and its instruments as expressions of human intentions and interests. As its name suggests, the approach centers an "absolute insistence on the *sequencing of actions* in practice" (p. xiv, emphasis in original) as a feature of any given scientific action. To produce a painted statue, one must first carve the wood, and then paint it. The methodical order of these actions cannot be reversed or changed if one wishes to realize the same goal.

But while this approach proves helpful in returning information and communication science to the pragmatics of human decision making, it at times runs afoul of certain quarters of contemporary media and cultural study. Janich's insistence that valid explanations of information systems must begin with an elementary reconstruction of the specifically and indeed exclusively human intention to communicate, for instance, leaves little room to account for the ways in which human intention invariably takes shape in conversation both with the technical and with discourses *about* the technical. There is, then, no zero degree of intention free of the traces of extant sociotechnical assemblages; no exclusively human site from which to begin the methodical building up of proper information and communication concepts. Indeed, if we take Donna Haraway (1991) seriously, to begin from human intention is *already* to begin from a less-, more-, or other-than-human intention. Janich's fixation on the human origins of contemporary information and communication concepts, thus at times, shades over into a shoring up of the human *as such* against both the technical and the animal, a tendency that will brush uncomfortably against not only Haraway's cyborg but as well against contemporary efforts in media theory to assimilate categories like mediation to the life process, or to extend such concepts toward all manner of nonhuman entities, from clouds to fossils to oil and beyond. Even those uneasy with these peculiar turns, however, will find in Janich a satisfyingly brazen attempt to dash the sort of magical thinking that continues to

accrue to the information concept and its various cognates—data (big or small) chief among them—in the contemporary moment.

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