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The Virtues of Critical Technical Practice

> Apply the test of true and false to problems themselves. Condemn false problems and reconcile truth and creation at the level of problems.
> —Deleuze

*T*his article follows several calls for cultural criticism to enter into the shifting and unstable field of the digital humanities, especially through engagements with sociotechnical problems that circulate in conditions of "informationalism" or what Luc Boltanski and Ève Chiapello describe as "connexionist worlds" where prior demands for authenticity and autonomy that first characterized critiques of mass consumer societies are assimilated by the deployment of networks and rhizomorphous paradigms of capital. Here, sociotechnical relations are tied together or knotted into compositions that facilitate circuits of accumulation. Alan Liu, in particular, has explicitly raised this issue through calls to consider how digital humanities might take on a stronger leadership role for the humanities at large by reflecting on its position in confrontation with these "great postindustrial, neoliberal, corporatist, and globalist flows of information-cum-capital." Curiously, in this appeal, new media studies is imagined as a corrective to the computational work associated with digital humanities research proper. For Liu, the ambition is to elevate a dialogue among programmers, researchers, theorists, hackers, and artists when it comes to developing new critical

methods and research standards in the academy. This article reflects on such an imagined dialogue by elaborating certain common difficulties of working with technical systems from a humanities-based perspective. My goal involves developing some shared conceptual vocabularies that might assist with building out new approaches to research, teaching, and scholarship, even if at times understood and grasped in quite different ways. In particular, this gesture is imagined in line with a commitment by digital humanities scholars to "discover new, and also very old, ways to be human" (4Humanities). A central aspect involves some clarification of what *cultural criticism* might mean for the digital humanities, especially in the hybrid forms exemplified, for example, by Critical Art Ensemble's (CAE) reading of tactical media, Brian Holmes's notion of *reverse imagineering*, or Julian Oliver, Gordan Savičić, and Danja Vasiliev's demand for "techno-political literacies" as stated in their *Critical Engineering Manifesto*. In this respect, I am especially interested in projects and frameworks that cultivate an *antipositivist* or problem-based encounter with digital and networked processes, a stance that, as glitch artist Jon Satrom ironically puts it, promotes "creative problem creation skills."

One way to approach this, I want to suggest, is through the work of Philip Agre, an inspiring scholar who has worked extensively to develop bridges between computer science and the humanities. Central to my reflections is his perceived need for "critical technical practice" (CTP).

> *The word "critical" here does not call for pessimism and destruction but rather for an expanded understanding of the conditions and goals of technical work [. . .]. Instead of seeking foundations it would embrace the impossibility of foundations, guiding itself by a continually unfolding awareness of its own workings as a historically specific practice [. . .]. It would accept that this reflexive inquiry places all of its concepts and methods at risk. And it would regard this risk positively, not as a threat to rationality but as the promise of a better way of doing things. (*Computation 23)

Originally developed in the context of artificial intelligence research, CTP has since influenced a diverse range of digital practitioners including Paul Dourish, Mary Flanagan, Garnet Hertz, Michael Mateas, Simon Penny, Warren Sack, and Phoebe Sengers. CTP, moreover, provides a valuable starting point for gauging the research conducted at the intersections of computation and the humanities as it catalyzes specific forms of knowledge. For Agre, the idea involves a kind of balancing act in a single disciplinary field: "one foot

planted in the craft work of design and the other foot planted in the reflexive work of critique" ("Toward" 55). Indeed, within the context of the digital humanities, the potential significance of Agre's work has already been noted; however, in this article, I am less invested in "epistemologically sound" methods and more concerned with an expansive understanding of what digital humanities might become (Rieder and Röhl). Indeed, CTP's double act of craft and critique invites reflection on transformations in sense and perception that occur through a suspension of "means" and "ends" across sociotechnical experience. This already complicates what can only be taken as gratuitous claims that method and theory are incongruous for the work of the digital humanities (Cohan). The more radical implications of CTP, moreover, involve some consideration of how the technicity of media and thought coemerge through projects that investigate widespread difficulties in connexionist or reticulated settings (Anderson; Frabetti).

It is telling that a key influence for CTP was Michel Foucault's reinterrogation of modern critique or the "Kantian attitude" (Agre, *Computation* 30–32 and "Toward"). It is worth recalling that Foucault described his work as "problematicization"; that is, an act of thought involving *the process of defining a problem* ("Polemics" 111–19). Problematization, accordingly, was a rare, concerted effort provoked by certain "difficulties" that arise from political, social, and economic processes. These difficulties sometimes mobilize thought by interrupting its consistency; they provoke multifaceted responses that together reposit the constitutive context of the problematic. Under such conditions, thought, for Foucault, is that which allows one to "step back" from conduct, to present conduct *as an object of thought* and to question its meaning, goals, and conditions: "[T]hought is freedom in relation to what one does, the motion by which one detaches from it, establishes it as an object, and reflects on it as a problem" (117). The act of freeing up conduct is the object of Foucault's work, but also its practice. Problematizations, in other words, are carefully sought out in historical archives and reposited in the present. Whether examinations of eighteenth-century responses to mental illness or health or debates over sexual ethics in the ancient Hellenistic period, for each case, "[W]hat is important is what makes them simultaneously possible: it is the point in which their simultaneity is rooted; it is the soil that can nourish them all in their diversity and sometimes in spite of their contradictions" (*Computation* 188). This repositing of problems—an act of both discovery and creation—lies at the center, I want to suggest, of Agre's conception of CTP.

There exists a strange doubling in refiguring a problem, a gesture of differentiation that can be secured neither by a set of formal policies, nor consequentialist criteria, but only in a movement that grapples with its own constitution. In a well-known lecture, "What Is Critique?," Foucault suggests that this critical attitude historically develops from the "high Kantian enterprise" (*to know knowledge*) to an everyday polemic as governmentality. In this way, criticality is an attitude innate to modernity: it is an act of defiance that delimits and transforms existing arrangements of power. In this context, Foucault refers to critique as "the art of not being governed, or better the art of not being governed like that, or at that cost" (45). Expressed as a will, critique is the deferral of judgment that drives praxis into a direct confrontation with presumptions, determinants, and motives on the terrain of power/knowledge. "If governmentalization is [. . .] this movement through which individuals are subjugated in the reality of a social practice through mechanisms of power that adhere to a truth, well, then! I will say that critique is the movement by which the subject gives himself the right to question truth on its effects of power and question power on its discourses of truth" (47). Refiguring problems by the interruption of habits, I argue, exists within an altered range of actions today, occurring equally through the capacity to suspend any "right" way of engaging with infrastructures, whether commercial interfaces, platform services, junked hardware, atmospheric sensors, or geotagged data. Critique is always formed within preexisting circumstances and settings but arises through "voluntary disobedience." There is constant risk, therefore, since critique is now caught up with difficulties carried along by insecurity and precariousness of connexionist worlds. Nevertheless, as Judith Butler observes, critique is "a moment of ethical questioning which requires that we break the habits of judgment in favour of a riskier practice that seeks to yield artistry from constraint." It is not based on correcting errors, but on the virtue of questioning the explications through which such distinctions of true and false cohere. This suggests, furthermore, that modes of criticality might turn to the standards and solutions maintained by technical objects, gadgets, protocols, sensors, algorithms, and other digital things. To stray from the strategic path is "voluntary" but only to the extent that decisions are enmeshed in a coalition of agencies; and in this way, we can begin to speak of CTP in terms of a particular conditional imperative: "[I]f you want to struggle, here are some key points, here are some lines of force, here are some constrictions and blockages" (Foucault, *Security* 18). One of my suggestions in this article, moreover, is that this struggle over problems can be considered as marking out a domain of technological

aesthetics, especially by embracing the "impossibility of foundations" found in suspended sociotechnical conditions of judgment.

The alteration of sense and perception in CTP speaks to the classic meaning of *aisthesis*, but now explicitly defined by sociotechnical events. Aesthetics is always concerned with the unclear, imprecise, or "dark" aspects of mastery and expertise, but here it explicitly spills into heterogeneous assemblages of enunciation and medial conditions of possibility (Menke). These materialities have implications for thought. Indeed, these are the radical challenges suggested in the transition from thinking of digital media as mere instruments to recognizing them as a milieu of action, what Friedrich Kittler famously describes as "networks of technologies and institutions that allow a given culture to select, store, and process relevant data" (369). Rather than necessarily denoting an elimination of the modern subject, however, this can potentially be reevaluated as a political environment for social life itself (Hansen). That is, if aesthetics is posed as the unthought of thought, then this movement is inevitably tied to the materialities of cognitive production and management of affect today.

Interestingly, these ideas can be found at the center of innovative research conducted through the use of digital methods. For instance, the Digital Methods Initiative (DMI) led by Richard Rogers is informed by a variety of debates around medium specificity that are ultimately rooted in questions of aesthetics, politics, and ontology. Rogers uses a number of media theorists who draw extensively from experimental artistic practice, such as Alexander Galloway, Lev Manovich, and Matthew Fuller, in his arguments supporting a turn to method "both in the sense of preferred means of studying particular media (audience research with diary-keeping in TV studies, for example) and in the sense of methods of the medium." DMI is mainly invested in empirical work that contributes to "Web epistemology," the notion of following the medium to research information systems—for instance, the way sociality and knowledge is handled on social media platforms through algorithms, scripts, trackers, or recommender devices. Claimed as being interconnected, two distinct concepts of *medium* central to the legacies of aesthetic theory are unified in this methodological agenda, one that arises in artistic formalism in the sense of a means for artistic expression and another that first emerges from nineteenth-century physics as a carrier of information (Cramer 12–14). Media artists, critics, and curators surely struggle with and even lament the conflation of such lineages, especially as this has exacerbated ongoing divides between media and contemporary art worlds (a mutual misrecognition that curiously recalls debates in the

digital humanities) (Quaranta). And yet, their imbrication also facilitates opportunities for rethinking inherited categories of experience in present configurations of digital and networked technologies, if only to the extent that these conditions are also understood as tied to revolutions and crises in the mode of production.

As a proposal, the turn to aesthetics as described here can seem like a dubious throwback in the context of the digital humanities. Indeed, as Florian Cramer notes, the notion of aesthetics in computer science more often resembles an interest in the beauty of perfect functionality and an appreciation of elegance drawing from "Pythagorean and Platonist ideas of the transcendence of beauty in mathematics, arts (music) and cosmology" (116). As a zone of philosophy dealing with the acculturation of senses and perception, moreover, aesthetics has historically been mobilized in questionable ways toward diverse projects of political emancipation. The affirmation of the excluded in aesthetic thought has, moreover, been regularly dismissed for promoting norms that actually conceal persistent inequalities and segregations. As Raymond Williams put it, "[T]he form of this protest, within definite social and historical conditions, led almost inevitably to new kinds of privileged instrumentality and specialized commodity," while, he adds, "the humane response was nevertheless there" (151). Such apparent contradictions in aesthetic thinking have, nevertheless, become important topics in recent cultural theory. The work of Jacques Rancière, in particular, has been key in exploring analogies between politics and "the aesthetic regime of art" prevalent since the Enlightenment (*Politics*). Aesthetics, in his account, explains a fundamental confusion or tension between heteronomy *and* autonomy (an "emplotment"), or the integration of art into everyday life and its irreducibility to means/ends relations (*Dissensus* 115–33). For Rancière, art is always defined as something more than itself, since aesthetics functions as at once removed from the political and simultaneously located within its sphere of influence by forever holding out the possibility of another world. Aesthetics, furthermore, involves a capacity or willingness to think this contradiction of autonomy and heteronomy. While critical of "critique," Rancière revives the post-Kantian project of aesthetics as a suspension of judgment and knowledge and thereby refigures the possibilities for politics in the recognition of other arrangements of sense. Here, politics and aesthetics overlap in disrupting existing states of social consensus or "the distribution of the sensible." That is, they intersect in their mutual deviation from the order of things, in *dissensus*, as revelations of a gap in the sensible itself (38).

In my view, Rancière's work, along with the condemnation of instrumentality found in the digital humanities debates, explains something of the centrality of art for the field of new media. Both impulses can be read as an antinomy that is central to the imbrication of innovation and economics in current sociotechnical conditions. Indeed, the latter presents a number of challenging intricacies. In a short essay "What Medium Can Mean," Rancière goes some way toward considering the implications of this "technological turn" for aesthetics. Here, the term *technology* is defined by multiple features: the ability to conduct specific operations; a general model of rationality organized by means and ends; the substitution of human acts by an apparatus; the extension of these operations by "seizing" the gaze, hand, or brain; and the lived world that ultimately accompanies these substitutions. Concerned mainly with photography, Rancière contemplates images of "disused edifices"—particularly Walker Evans's image "Kitchen Wall, Alabama Farmstead" (1936) and Frank Breuer's documentation of shipping containers (2009)—suggesting that such works are formed by multiple fissures in knowing that significantly complicate a simple instrumental model for technically produced images. In these photos, the composition of the work, aspects of order and disorder, the "objectivity" of the apparatus, and the issue of being art or not are set loose in ways that invoke the classic schema for Kantian aesthetics in a dual sense of "the intentional production of art which pursues an end and the sensible experience of beauty as finality without end" (41). These experimental aspects, interestingly, follow the thematics in each image of labor, tools, and technology given the absence of a discernible subject.

Rancière outlines some of the stakes for technology and aesthetics from the perspective of "art-effects" given the multiplication of media technologies. As opposed to claiming that art remains "sovereign" by default or is dissolved in a world of technology, he proposes that aesthetics might allow for technology to become "indifferentiated" through an art of *despecification.* That is, the removal of technical relations of means/ends allows for a milieu to develop "organized according to new intersections between arts and technologies, as well as between art and what is not art" ("What Medium" 42). Certainly, from this angle, digital and networked technologies can be envisioned as moving into zones of neutralization proper to art, but what does this mean when taken inversely in the terms of science, engineering, and technology? What implications arise once the logic by which art is read as just another technique of optimization is suspended? How is a work born from *infrastructure* then refigured once detached from the demands to

remain "positivistic, strictly quantitative, mechanistic, reductive and literal" (Drucker)? These questions, I want to suggest, imply a politics of technology by proposing that dissensus also exists in the domain of *techne*. Taking account of analogies with politics marked out by Rancière, how might the entrance of technology into the aesthetic transform conditions of possibility for what has already been established as the digital humanities?

Informational technologies are typically led by competitive demands for problem solving in the management of knowledge work. From data-driven insights to business solutions and productivity apps, software trades in an administration of efficiency that restructures existing behaviors in complex and often profound ways (Agre, "Surveillance"). Procedures of operationalization and optimization are, in this respect, enmeshed in power relations, since guiding the formation of problems means leveraging events toward a set of strategic ends. To quote, for example, from Google's philosophy: "[F]inding an answer on the web is our problem, not yours. We try to anticipate needs not yet articulated by our global audience, and meet them with products and services that set new standards." This frequent commandeering of problems by informational corporations is not something that has gone unnoticed in public discourse; the controversial tech critic Evgeny Morozov, for instance, has used the term *solutionism* (borrowed from architecture and urban planning) to describe how "empowered geeks" frequently cast "all complex social situations either as neatly defined problems with definite, computable solutions or as transparent and self-evident processes that can be easily optimized—if only the right algorithms are in place!" (5). Of course, poorly understood technical matters can easily lead to unintended or unanticipated outcomes; yet, a more urgent concern undoubtedly resides with an overarching logic of intervention whereby the orchestration of disruption itself delivers significant redistributions of power, wealth, and influence. Such dynamics are central, for instance, to prevailing economic thinking that posits the market as a vast information processor and the only possible solution to problems generated precisely by the market itself (Mirowski). Indeed, in conditions of ongoing ecological and financial crisis, gaining access to collective problems is part of a struggle to articulate and organize the common. In contrast to claims for openness as a necessary good, it is perhaps in these spheres of action that the rise of the digital humanities might be most dramatically reframed and reimagined.

The expediency of CTP, in this respect, can be articulated by turning to lineages of antipositivist epistemology. Precedents exist not only in the work of Foucault, as I have suggested, but also in a range of thinkers

such as Henri Bergson, Gaston Bachelard, Georges Canguilhem, and Gilles Deleuze (During). Described as "super empiricism," this mode of thinking arises from philosophical investigations into the history of science and is cast against methods where problems are presumed as already given, where facts and falsehoods are predetermined as such. For Deleuze, it moves beyond a situation where "[t]he master sets a problem, our task is to solve it, and the result is accredited true or false by a powerful authority. It is also a social prejudice with the visible interest of maintaining us in an infantile state, which calls upon us to solve problems that come from elsewhere, consoling or distracting us by telling us that we have won simply by being able to respond: the problem as obstacle and the respondent as Hercules" (*Difference* 158). Here, knowledge is utilized to drive modes of contest and accumulation without access to how these issues are determined, without the right to problems or, more explicitly, without a capacity for a "problematization of problems." Such reasoning should be familiar; however, this perspective can be productively reimagined in distinctive ways through new media devices. This includes complex questions of material participation, especially as they transform frames of technology, while enacting topological renditions of sociotechnical problematics (Marres). One might consider, in this respect, an important strain of media arts that geotagged data and capturing devices with other types of situated knowledge. Of particular relevance is Esther Polak's reflective use of GPS in documentary-inspired locative artworks like *MILK Project* (2005) and *NomadicMILK* (2010) in ways that enmeshed both anecdotal narration and logistical supply chains, or the "dislocative" work *Border Bumping* (2012) by Julian Oliver that recomposes existing national borders based on cellular infrastructures. Such projects provide spaces to consider the topologies consistently inaugurated by informational domains of knowledge production. In these cases, everyday sociotechnical arrangements are presented as a problematic object to thought.

          In this respect, CTP can be understood as connected to an array of ethical quandaries that arise through decision-making and governance in epistemological regimes. As Sean Cubitt notes, a central function of the humanities has traditionally involved raising problems to seek out "the exceptional within the typical."—"[I]t asks whether we can accept the exception even of one instance as the price of our common assurance of success; it tests the happiness ascribed to beneficiaries of policies and knowledge, nagging at any loose tooth or hangnail." Foregrounding the deficiencies of procedural descriptions and generalist inquiry, Cubitt highlights the strength of anecdotal evidence to "slip the knot" of archival systems, patterns and

the "typical." In this way, testing administrative mindsets involves a critical attitude toward standardized abstractions. Indeed, it should be noted that even on a formal level, operationalized modeling and logical processing of computation generate ambiguities, paradoxes, and other expressions also handled as *exceptions.* As a researcher and artist working precisely with such glitches, Rosa Menkman notes,

> *I feel that many people have lost the ability to formulate questions—this generation has become good at researching and finding answers or creating new datasets: in university, in the library, or on google ("the internet") we are conditioned to find and formulate answers [. . .]. Personally I think that one of the most important roles of art is to create problems that provoke curiosity—the impulse to investigate the limits of what we know and to ask questions. (Debatty and Menkman)*

Significantly, Menkman's work exists in a transdisciplinary register and incorporates documentation, critical media theory, curatorial work, blogging, data visualizations, artistic performances, and the collaborative creation of tools. Working with problems here involves an expansive set of research priorities and intuitions, opening onto a wide variety of techniques and styles. These differing approaches are not always commensurable with each other. Taken together, they require an appreciation of their inherent limits.

Indeed, to engage with problematization entails some critical rendezvous with the parameters of governance. It is a passage that recalls the work of the Enlightenment subject, but more through the recovery of actual lived experiences than through transcendental categories for all possible experience. Such a distinction is essential, since it acknowledges how thought is entangled with the historical materialities of technical mediation, along with recognizing the singular qualities of the aesthetic— in other words, experiencing the abstraction of digital systems through encounters that disturb the formal universalities of communication and exchange. This can be illustrated in the work of YoHa (Graham Harwood and Matsuko Yokokoji), whose elaborate contraptions are built as a form of action research into sociotechnical ensembles. Projects such as *Invisible Airs* (2011) utilize open data from the Bristol City Council, for instance, to drive pneumatic devices that materially enact the entanglements of relational databases with modes of institutional power and the expenditure of resources. Books are "balanced" through devices with automated stabbing knifes, spud-guns are triggered by parsing expense accounts, while

a "riding machine" jolts council officials according to specific metrics. Similarly, *Endless War* (2012–), produced with Matthew Fuller, explores the "Afghan War Diary" dataset released by Wikileaks as a product of socio-technical systems of military knowledge. Composed as an installation, the computational assemblage queries the original 108 MB file at a decelerated rate over a month-long period, splitting the information processing across three screens and sonically amplifying the mechanical operations of the hard drive. By composing multiple points of encounter, it explores how the effective procedures of algorithmic calculation are tied to the propagation of standard phrases, jargon, acronyms, and other set descriptors that facilitate the identification of patterns. In this way, notes Fuller and YoHa, "*Endless War* shows how the way war is thought relates to the way it is fought. Both are seen as, potentially endless, computational processes. The algorithmic imaginary of contemporary power meshes with the drawn out failure of imperial adventure" (YoHa). The project, therefore, differentially recreates the machinery through which adequate knowledge is produced and possessed. For Harwood, this method is a physical diagramming "made up of situations, peoples, geographies, networks, technicalities that bring the historical, social, economic, political into proximity with each other to create a moment of reflection and imagining." The physical diagram becomes an *irritant*; by decoupling sociotechnical ensembles from seemingly stable configurations, it prompts and propels a consideration of how things might be otherwise.

The schema for problem formation I have been describing ultimately raises a final set of difficult questions regarding whether there is anything "radical" or "political" about these critical practices, especially when faced with the ceaseless demand for innovation and efficacy in the current intellectual environment of digital humanities. In this respect, as a proposal for considering aesthetics, the cultivation of antipositivist epistemologies brings about its own dilemmas. Such experiential realities can lead to a sense that the vitalist aspect of problem creation will only ever offer a minor rearrangement of existing conditions rather than found sustainable alternatives to current problems for politics in reticular capitalism. As Theodor Adorno once put it, commenting on strains of process-based ontologies, "[T]he dialectical salt was washed away in an undifferentiated tide of life" (8). This is a familiar criticism in historical materialist circles, since processual senses of problematization as an affirmationist account purposefully complicates any vision of an unexpected or antagonistic eruption of the future. When taken as an interventionist stance, such arguments recall the

notion of tactical media as a fleeting event that only ever reshuffles already existing sociopolitical conditions. In this respect, as I have noted, the junction of aesthetics and politics is a complicated one; from Walter Benjamin onward, the politicization of art involving media technologies appears as an enigma caught between modalities of autonomy and subjugation.

In relation to these broader questions, for programmer and artist Dymtri Kleiner, the politics of artistic problem formation can be described as producing *social fictions.* As opposed to science fiction—where historical changes are imagined through speculative future technologies—in social fiction, the technologies already exist, but the society is speculative or "missing." In other words, we have the technology, but we lack adequate sociopolitical imaginaries. As Kleiner demonstrates with "miscommunication platforms" produced by Telekommunisten, such an account is broadly suggestive as a critique of digital technology itself as "revolutionary," raising questions of what kind of institutions we currently require. It also recalls how tensions and conflicts in aesthetic projects imply a resolution that can only be brought about through determined organized change. This is precisely the problem of the "transcendent exercise." It speaks to the power of artful intuitions for digital humanities, redirecting attention away from false problems by holding open "the social power of difference, the paradox of society, the particular wrath of the social idea" (Deleuze, *Difference* 208). The problematic here is always an uncertain domain, sketched out through the *differentiating* dimensions of sociotechnical action itself. Nevertheless, one of my central claims has been the urgent need for anticipating how this unfolds through infrastructural worlds: how living beings are not only individuated as human subjects but constituted through a more-than-human field of forces, tensions, and individuations. If critical conditions are, therefore, suggestive, they reside across an array of agencies that articulate a still unfolding historical process. Critique for the digital humanities thus faces the challenge of working with things by forging associative milieus while they yet remain vital, productive, and beneficial for every entity involved in their elaboration. In my account, CTP brings into sense and perception the cartography of these complex issues, while aesthetics allows common resources for an exodus from connexionist worlds.

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