Routledge Handbook of Surveillance Studies

Edited by Kirstie Ball,
Kevin Haggerty and David Lyon

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a. Panopticon—discipline—control

Greg Elmer

Of the three concepts in this chapter's title—*panopticon*, *discipline* and *control*—only *discipline* is fully and directly explicated in the work of the late French philosopher Michel Foucault, still the preeminent theoretical figure for surveillance studies scholars. The *panopticon*, which has overwhelmingly served as a common theoretical and polemical point of departure for surveillance studies, is a derivative concept stemming from the letters and architectural drawing of English social reformer Jeremy Bentham (1748–1832). And while the concept *control* is both directly and indirectly addressed in a number of Foucault's essays and books, its application in surveillance studies has typically emerged from Gilles Deleuze's (1992) brief essay "Postscript on the Societies of Control," itself an extension of the philosopher's book *Foucault* (1988).

While some surveillance scholars (Haggerty 2006; Murakami Wood 2007) have offered expansive discussions of the limits of Foucault's panoptic writings, this chapter argues that such critiques tend to attribute the theoretical contributions of such concepts to Michel Foucault alone, negating the interpretive process involved in developing these key concepts. In other words the panopticon has been largely defined by one text (Foucault's *Discipline and Punish* 1977), not as an effort by Foucault to critique Bentham, or Deleuze to likewise reassess Foucault. This chapter consequently defines *the panopticon*, *discipline* and *control* as *interlocutive concepts* in surveillance studies, that is as terms that together inform Foucault's panoptic surveillance (Bentham's *panopticon*), serve as the core political contribution within Foucault's panoptic writings (*discipline*) and lastly, offer forward-looking and technologically networked theories of panoptic surveillance (Deleuze's Societies of *Control*). Consequently, it is argued that reading across such key concepts may provide new interpretive frameworks for surveillance studies—ones that recognize the inability to surveil and monitor, rethink the nature of subtle yet coercive forms of governmentality, and lastly, begin to theorize future-oriented and probability-based aspects of contemporary panoptic relationships.

Following a historical—or more aptly put, archaeological—order, the chapter begins with a discussion of *the panopticon*, before turning to the concepts of *discipline* and lastly, *control*. There is a logic to this order beyond publishing history. First, as a master signifier of sorts (and notably, the only noun in this grouping of concepts), *the panopticon* for better or worse continues to serve as a key theoretical frame of surveillance studies. As we shall see, however, for Foucault the panoptic prison first and foremost served to explicate a logic that could be seen at work in the spatial design of a series of key social, medical, educational and psychological institutions. The building blocks of surveillance studies, if we can refer to these central concepts as such, thus begin with Foucault's interpretation of an architectural plan for a panoptic building. This deconstructive move calls into question the externalization of panoptic gazes at work in surveillance

studies and their subsequent assumption of a panoptic theatre that assumes—at all times—a meaningful panoptic object.

The concept *discipline* as developed by Foucault, in the context of his writings about the panopticon in *Discipline and Punish: The Birth of Prison*, first published in 1975 (1977 in English), amplifies the philosopher's theory of power, as a bio-political phenomenon, an internalization of power. Curiously the notion of self-governing, or modifying one's behavior in the face of the panopticon, is perhaps one of the least developed theories in surveillance studies. As such, this section of the chapter emphasizes Foucault's theory of panoptic subjectivity, the importance of automated forms of political power and his more implicit critique of Bentham's liberalism. This section subsequently seeks to offer a more explicit discussion of the nature of coercion in the work of Bentham and Foucault, a remedy for the overly individualistic concerns—notably loss of private property—in surveillance studies scholarship.

Moving to the third concept, the chapter argues that *control*—in particular as articulated in the work of Gilles Deleuze—has tended to lend more weight to networked and immanent forms of surveillance, perspectives that highlight and otherwise question the ever-changing and ever-expanding surveillance systems, mechanisms, protocols, policies, techniques and technologies. This last section of the chapter questions why surveillance studies is far more likely to cite Deleuze's brief and sketchy postscript, than his preceding book-length manuscript—a work entirely dedicated to the work of Michel Foucault. It is argued that the postscript's explicit object of study—new technologies—has obscured or displaced the theoretical contributions that Deleuze brings to Foucault's disciplinary mechanisms, which call into question the immanent process of managing and governing the future.

Recentering the panopticon

While surveillance studies has developed a strong attachment to *the panopticon* as a guiding theoretical inspiration, the concept's genesis as both an architectural drawing and a set of letters, *as interpreted by Foucault*, is largely unexplored (see Murakami Wood 2007 for some exception to this oversight). Studies of Foucaultian panopticism often treat Bentham as an introductory footnote and fail to question how *the panopticon* has emerged from a decidedly selective translation and interpretation. Oscar Gandy (1993), for instance, in the seminal book *The Panoptic Sort: A Political Economy of Personal Information*, says only that "It is from Foucault that I derive the underlying concept of panopticism … The Panopticon is the *name* given by Jeremy Bentham to the design for a prison" (my emphasis, 9). To speak of the panopticon, in other words, is to all-too-often reference only Foucault's words, not the distinct interpretation of Bentham's panopticon plans and letters. The panopticon was not just a name or title for a building coined by Bentham, it was a sustained political project, and a schematic drawing of a reformist liberalism. It was in other words an expression of a much broader political philosophy, replete with an architectural drawing to explicate its intended effects. The core theoretical and political contributions of Foucault's *Discipline and Punish* cannot be grasped without noting the diversions, interpretations, strategic omissions and outright rejection of passages from Bentham's series of letters on the panopticon from 1787 (see Bentham 1995).

Bentham's panoptic writings were developed and subsequently published as a series of letters and an architectural drawing of a prison that invoke strong visual imagery of sightlines and architectural viewpoints. They connote a 'plan in the making,' a proposal whose components were expressed and shared in specific details, moving the reader through the exact measurements of an entire building. The first set of letters (numbers I-VI) are designed to capture the imagination of the addressee, the last two (letters V and VI) subsequently provide an overarching summary of the panopticon's architectural advantages. In conjunction with the drawings or plans of the panopticon these introductory letters form the fundamental architectural or diagrammatic components of Foucaultian panopticism—they invoke a plan that embodies a theory of power.

Focusing on these first six letters we can clearly see where Foucault in many respects inverts the governmental aspirations of Bentham's panopticon, an interpretation that places the panoptic subject at the

centre of the panopticon. The distinction moves the focus away from the building as such, to the prisoners, from the act of directly watching to the probability of being watched. The role of the panopticon's tower and "inspector," to use Bentham's term, serves as a fundamental difference between the two authors' work. The second of the panopticon letters introduces the importance of the centre of the building, for Bentham much more than a tower or viewing position—the tower also doubles as a residence: "The apartment of the inspector occupies the centre; you may call it if you please the '*inspector's lodge*'" (Bentham 1995: 35). Bentham further explains that, as a familial, domestic space, the lodge plays a key role in the efficient monitoring of the inmates:

> A very material point is, that room be allotted to the lodge, sufficient to adapt it to the purpose of a complete and constant habitation for the principal inspector or head keeper, and his family. The more numerous also the family, the better; since, by this means, there will in fact be as many inspectors, as the family consists of persons, though only one will be paid for it.
>
> *(Ibid.: 44)*

Bentham, in short, instilled a patriarchal regime of surveillance at the center of his panopticon, one that emphasized the intransigence and immobility of the inspector and his family, as much if not more than that of the prisoners themselves.

In Bentham's panopticon the inspector and family are themselves effectively isolated, segregated or, ironically, jailed, a set of characteristics more commonly associated with Foucault's prisoners. For the family in the tower there is seemingly little else to do but watch. Watching for Bentham is automated. Foucault too agrees that the panopticon produces an automatic effect, yet with no reference to the residence and its workings at the heart of Bentham's panopticon. Foucault's panopticon emphasizes an enactment of surveillance, a subjectivation of power, as instilled in prisoners who architecturally speaking must assume ubiquitous surveillance, that they may be under inspection at any time, night or day. What distinguishes Foucault's and Bentham's definition of *the panopticon* is *perspective*, meaning that the view outward from the residence, the tower—in Bentham's terms is a site and mode of "seeing without being seen" (ibid.: 43). Conversely, for Foucault the panopticon could not be reduced or framed by a unidirectional gaze from the centre, tower or singular managerial gaze. Conceptually, for Foucault, the prisoners, not the tower, are at the centre of the panopticon. For Foucault the panopticon served as a metaphor, contra Bentham it was not to be coupled with—or reliant upon—the very act of watching, it was to be viewed as a logic and process. Foucault dubbed the panopticon a "laboratory of power," not only to highlight its experimental nature, but also to indicate its continuous search for improvement, its "gains in efficiency" (Foucault 1977: 204). But, most importantly for Foucault:

> the Panopticon must not be understood as a dream building: it is the diagram of a mechanism of power reduced to its ideal form; its functioning, abstracted from any obstacle, resistance or friction, must be represented as a pure architectural and optical system: it is in fact a figure of political technology that may and *must be detached from any specific use* [my emphasis].
>
> *(Ibid.: 205)*

Unlike Bentham's then, Foucault's panopticon insisted upon its figural qualities to note the productive potential of systems that constantly repeat functions. Foucault also employed a definition of surveillance that extended right to the "top" of Bentham's hierarchy with the inspector also under surveillance. In Foucault's own words:

> The Panopticon may even provide an apparatus for supervising its own mechanisms. In this central tower, the director may spy on all the employees that he has under his orders: nurses, doctors,

> foremen, teachers, warders; he will be able to judge them continuously, alter their behaviour, impose upon them the methods he thinks best; and it will even be possible to observe the director himself … enclosed as he is in the middle of this architectural mechanism, is not the director's own fate entirely bound up with it?
>
> (*Foucault 1977: 204*)

Later we discuss how conflicting notions of the surveillant gaze have informed contemporary studies of reality television and web-based forms of social networking, particularly as theorized by Mark Andrejevic (2004). However, our discussion of the panopticon unearths a remarkably divergent notion of the panopticon interpreted—and subsequently inverted—by Foucault. Foucault's inverted panopticon has, however, had only marginal influence among surveillance studies. Rather, it is Bentham's panopticon that has served as a template in that at its centre lies a *meaningful* or perhaps *valuable* panoptic object, whose actions are said to be tracked and logged, not intentionally modified. Privacy—a common theme in surveillance studies—is therefore not just a response to over-surveillance, rather it is an extension of the panopticon's tower, a coupling of Bentham's act of watching with capturing or otherwise registering a history of behavior.

But Foucault's panopticism, and his contributions for surveillance studies, have little to do with claims to personal property and privacy (information/objects that can be collected through surveillance). Rather, Foucault's inverted *panopticon* sought to establish the potential political effects of a ubiquitous form of institutional power, not an all-seeing or all-registering eye, but a landscape that could at any time impart in an individual a likelihood of surveillance. While Foucault goes to great length to emphasize the subsequent internalization of power, the self-governing effects of the *panopticon*, it is only through coupling his thoughts on disciplinary power that we can further explicate the importance of his critique of political coercion.

Discipline: subtle coercion

The distinction between watching (Bentham) and being watched (Foucault) ultimately serves to distinguish fundamental *political* differences between the two authors. While many have focused on what Foucault took from Bentham (*the panopticon*), far fewer have noted what he directly rejected—Bentham's liberalism, defined as freedom from coercion. For Bentham, the panopticon served as a form of autonomy, a new-found freedom for the prison's managers. In the panopticon the attendent need not worry about the direct intervention of judges and other superiors who might otherwise be called upon to inspect and monitor the supervision and functioning of the institution. Freed from the burden of themselves being subject to oversight (from judges and the like), Bentham argued that the transparency of the [panoptic] building "ought to be, thrown wide open to the body of the curious at large—the great *open committee* of the tribunal of the world" (Bentham 1995: 48). Bentham's prisoners were also liberated from more overtly coercive forms of institutional violence. A liberal humanism lay at the heart of Bentham's panopticon letters.

Bentham's panopticon insists upon the apparent "omnipresence" of the inspector to avoid coercive forms of punishment, yet he also continuously notes through the letters that inspection has a "*real presence*" (ibid.: 45). Building upon this fundamental difference between Foucault and Bentham, this section of the chapter notes that, relative to our other concepts, *discipline* is the only concept that can be said to be uniquely Foucaultian in inspiration and development. The concept is a pivotal one as it anchors and thus gives political weight to Foucault's definition of panoptic subjectivity discussed above. It cultivates a self-governance, an automatic subservience, without need for direct monitoring and management.

While the most persistent and explicit thoughts on *discipline* flow immediately out of Foucault's afore-mentioned analysis of Bentham's panopticon letters (with numerous direct quotes and paraphrased sections), in *Discipline and Punish*, Foucault's discussion of *discipline* reintroduces readers to his familiar archeological style of writing. The historical case studies in *Discipline and Punish* explicitly seek to move

beyond a literal interpretation of the panopticon-as-institutional-prison, to a discussion of how like-minded self-governing forms of power are intensified and expanded across the social field:

> There are two images, then, of discipline. At one extreme the discipline-blockage, the enclosed institution, established on the edges of society, turned inwards towards negative functions: arresting evil, breaking communications, suspending time. At the other extreme, with panopticism, is the discipline mechanism: a functional mechanism that must improve the exercise of power by making it lighter, more rapid, more effective, a design of subtle coercion for a society to come.
>
> *(Foucault 1977: 209)*

Through the introduction of the notion of *discipline* Foucault articulates a generalizable logic of Bentham's panopticon, though importantly one that, unlike Bentham's search for individual freedom, still recognizes a coercive dynamic at play. Such is not however the case with most contemporary studies of surveillance cameras, ID systems or DNA databases, projects that typically maintain Bentham's central concern over individualized forms of coercion. Such surveillance studies posit coercive effects as flowing out of—or more aptly put, external to—the act of surveillance. Coercive effects, in other words, only result out of the misuse of data/objects collected by surveillance systems, for example by misidentifying the innocent as the guilty. For Foucault, however, the concept of *discipline* posits a range of panoptic practices. At the far end of this range—generalized and social—Foucault again turns from moral language over modifying behavior to governmental and economic metaphors and terms. Unlike Bentham, Foucault uses *discipline* to produce a new form of political subjectivity and economy, not properties, data doubles or virtual selves (Poster 1990). Reading Foucault through Bentham reintroduces a subtle form of coercion, a routinized political and economic subservience that produces docile subjects. For Foucault there can be no panopticon without such discipline, its productivity is social, expansive and governmental, not external, contingent or subsequent.

Such a "disciplinary society" thus raises important questions about the future: the subtle power/discipline of a generalized panopticism, an internalized power that seeks to pre-plan—to economize the past, present and future. That Foucault locates such mechanics and concepts at one end of the disciplinary framework, however, should not obscure the author's overall goals to highlight the process of disciplinary mechanisms, an expansionary imperative toward the social pole, an intention clearly written into one of Foucault's few concise definitions of the concept in question:

> 'Discipline' may be identified neither with an institution nor with an apparatus; it is a type of power, a modality for its exercise, comprising a whole set of instruments, techniques, procedures, levels of application, targets, it is a 'physics' or an 'anatomy' of power, a technology.
>
> *(Foucault 1977: 215)*

Foucault thus posits three criteria of disciplinary mechanism, first, its search for the "lowest possible cost," both economically and politically speaking; second, the extension and intensification of its powers and scope in an effort to avoid failure; and lastly, to link the economic growth of disciplinary power with institutional output, or in his own words "increase both the docility and the utility of all elements of the system" (ibid.: 218). Foucault's point here is that the disciplinary mechanism lies at the heart of the political economy, it both enables—and is enabled by—what he later dubs an "art of government."

In moving from the institutional or architectural to the governing of a multiplicity of subjects, and a future governmentality or art of government, Foucault's political economy in *Discipline and Punish* still rests upon a restrictive spatiality, not an incarceration but an isolation still of sorts, an *in-situ process of dividuation*. Thus while disciplinary mechanism seeks to account for human multiplicities on a distributed scale, for Foucault, they also work to "fix" or otherwise operate as an "anti-nomadic technique" (ibid.: 218). It is here, moreover, that the limits of Foucaultian panopticism and discipline begin to lose their elasticity, particularly for Gilles

Deleuze whose interpretations of Foucault's writings sought to unfix the subjects of surveillance, to enable a fluid social and individual field, while still maintaining empirical and political goals.

A diagram of control

Of the concepts under analysis herein, *control* is the most widely invoked by scholars intent on expanding Foucault's thoughts to networked computing and other digitalized forms of communication and information management. This should come as no surprise given that the concept is largely attributed to Gilles Deleuze's very brief essay "Postscript on the Societies of Control" (1992). The concept *control* itself is only briefly offered by Foucault in *Discipline and Punish*—and, ironically, only in reference to the historical epoch immediately *preceding* the disciplinary society (with the plague as social object of surveillance): "Rather than the massive, binary division between one set of people and another, it called for multiple separations, individualizing distributions, an organization of in depth of surveillance and control" (Foucault 1977: 198). In the "Postscript," however, Deleuze argues that societies of control "are in the process of replacing the disciplinary societies" (Deleuze 1992: 4). And with reference to the panopticon he makes an atypically stark distinction: "Enclosures are molds. … but controls are a modulation" (ibid.).

Before further investigating these words from Deleuze, let us first note that the "Postscript" does not offer a wholly distinct view from Foucault, particularly with regard to the notion of time. For Deleuze, Foucault's disciplinary mechanisms laid the groundwork for the ability to infer or anticipate, since in Foucault's own words "mechanisms of power … instead of preceding by deduction, are integrated into the productive efficiency of the apparatuses from within" (Foucault 1977: 219). In his postscript Deleuze invokes William Burrough's use of the near-future as a setting for his immanent conceptualization of control mechanisms (Deleuze 1992: 4). Similarly, Deleuze also conceived of the temporal aspects of social control through Kafka's *The Trial*, a story that witnessed an indefinite suspension of the law, or in his words "limitless postponement" (ibid.: 5). Both such perspectives however remain largely underdeveloped in "Postscript on the Societies of Control," leaving the reader wondering more about how social control is "modulated" through the near-future.

Apart from its brevity, the other obvious limitation of Deleuze's "Postscript on the Societies of Control" is that its main concept—*control*, or better still *control societies*—is rarely recognized or interpreted as a *postscript*. Written four years before the "Postscript", Deleuze's manuscript *Foucault* (1988) arguably reserves its most intensive reading, and at times its most glowing moments of admiration and appreciation, for *Discipline and Punish*. In the chapter entitled "A New Cartographer," Deleuze offers two key contributions to what he would later refer to as "societies of control." First, Deleuze does not see panopticism as a formula where one sees "without being seen"—that is assuming the position of the tower or its guard(s). Rather, in drawing upon the disciplinary sections of *Discipline and Punish*, Deleuze argues that panopticism is a mechanism that seeks "to impose a particular conduct on a particular human multiplicity" (Deleuze 1988: 34).

Deleuze's overall contributions to his later more explicit conceptualization of social control lie in the seeming contradiction at the heart of Foucault's panopticon: "Discipline and Punish is the book in which Foucault overcomes the apparent dualism of his earlier books (although even then this dualism was already moving toward a theory of multiplicities)" (ibid.: 39). While Deleuze characterizes Foucault's earlier work as engaging with questions of vision and expression, in *Discipline and Punish* he sees Foucault working his way out of the confinement of the panopticon as such, in short moving beyond the duality of *either* forms of matter (the prison itself) or forms of function (punishment) (ibid.: 33). Deleuze does not see such an equation as a contradiction in Foucault's overall argument. Panopticism is not an abstract generalization, nor an act of watching or being watched, or content and expression, rather Deleuze argues that both "forms" are in flux, the productive capacity of which (or more precisely the means through which social control is modulated) resides continuously in an "informal" space. Deleuze thus poses the question:

> What can we call such a new informal dimension? On one occasion Foucault gives it its most precise name: it is a 'diagram' … The diagram is no longer an auditory or visual archive but a map, a cartography that is coextensive with the whole social field … a diagram is a map, or rather several superimposed maps. And from one diagram to the next, new maps are drawn.
>
> *(Ibid.: 34, 44)*

While Deleuze's subsequent *postscript* to the diagram has helped to situate surveillant practices and processes within the context (or as enabled by) information systems, techniques of digitization and computer networks, the concept of *control* derived through a modulating set of practices and relations among social forces remains similar to Foucault, as a theorization of subjectivation, albeit as a geographically dispersed multiplicity. Alex Galloway's interpretation of internet *protocols* as diagrammatic machines (2004) likewise suggests how Foucault's biopolitical theory of subjectivity might also explain the governance of a network of things or digital objects.

Deleuze's *postscript* adds important time-based after-thoughts to his expanded concept of the Foucaultian diagram. The Deleuzian subject is embedded in a set of relationships that are increasingly fluid and in flux, and the ability to impart social norms and other forms of behavior conformity is not as easily synthesized as in Foucault's panoptic diagram. In other words, Deleuzian *control* invokes a set of informal relationships that nevertheless expand their points of contact, seek to reassign and reduce inefficiencies and spawn new cartographic mechanisms (or "machines" as Deleuze would say). The need to constantly seek out the truth suggests not only an immanent surveillant apparatus, but also one that seeks to pre-dress the near-future—to redouble past relationships so as to predict future inefficiencies. Foucault (2007) likewise foresaw disciplinary mechanisms morph into security apparatuses, the latter seeking to prescribe future relationships (what-ifs) based upon a set of "probabilities" that "works on the future … [it] will open onto a future that is not exactly controllable, not precisely measured or measurable [rather a] … plan that takes into account precisely what might happen" (ibid.: 19, 20).

What emerges is a concept of control that builds upon Foucault's interior economy, the self-governing machine that not only subtly coerces subjects into docile states, but also integrates such subjects into the machinations of wider economies, including the circulation of information and objects. Deleuze's diagram provides a more explicit rationale for expanded sites of surveillance, seeking to manage production, circulation and consumption of modern economies, with forward-looking "profiles"—simulated pictures of future demands, needs and risks. Such a networked approach, however, does make the error in assuming a meaningful object of surveillance. Rather, the diagrammatic process itself *produces or assigns a range of values to objects,* it seeks to determine the meaningfulness of surveillant objects within the context of networked economies.

Conclusions

Given the staggering amount of material, of interpretations, polemics, and indeed translations, of Foucault's panoptic writings, one can easily sympathize with authors such as Kevin Haggerty (2006) who suggest that we should "demolish the panopticon" to make way for new interpretations, theories and objects of study, namely non-human actors and forms of medical surveillance more often associated with benign regimes of care. But this is based on a common flawed assumption about Foucault's central thesis—that "Panoptic surveillance is fundamentally concerned with monitoring people" (Haggerty 2006: 30). Rather, if we bring together our interlocutive concepts discussed through this chapter, we can begin to question common assumptions of canonical texts, a practice that hopefully opens up new forms of empirical and theoretical research in surveillance studies.

It seems that Haggerty assumes a Benthamite perspective, defining panoptic surveillance as a human act of watching (or as being individually identified, as privacy scholars typically do), not the assumption of always being watched. Such a distinction has important political implications, one that speaks from the

Foucaultian-Deleuzian trajectory as critiquing non-sovereign, or better, unquestioned, forms of social and political power—a quiet conformity that is only intensified by its automation, embeddedness and modulation that *informs* the near-future. Automation is the key concept. Only through the subsumption of power, the internalization of a probable gaze, can the panopticon transform into a disciplinary society that displaces and elides the face of power.

Scholars who begin their analysis of surveillance from a panoptic gaze risk disarticulating the subject from social forms of power, leaving only individuals and their transgressed liberties. Mathiesen's (1997) inversion of such a gaze into a synopticon—from Bentham's one (tower) watching the many (cells), to the many watching the few (eg. contemporary media culture)—similarly displaces Foucault's central thesis on disciplinary power and his important critiques of liberalism. How might the synopticon shift the nature of contemporary governmentality? Taking us back to Foucault's thesis on subjectivity, Mark Andrejevic (2004) argues that such synoptic relationships—for instance on reality television—are not simply questions of personal privacy, information to be collected by surveillant gazes. Rather, focusing again on the panoptic subject, or in this case the synoptic subject (reality program contestant), Andrejevic argues that to be under the media gaze is to perform work, "the work of being watched."

More importantly, such work does not simply put one's private property at risk, but rather—predating the emergence of social networking platforms like *Facebook*—Andrejevic's synoptic example highlights the Foucaultian concern with self-governance, not a loss of privacy, but in this instance *the management of one's personal publicity*. Such a political economy of surveillance, linking the downloading of work, and the management of individual networked-identity, serves as an important update to Foucaultian-inspired critiques of contemporary forms of liberalism (or neo-liberalism), particularly in the context of a governmental regime and set of policies that have sought to "liberalize" markets, societies and individuals in an effort to increase efficiencies.

Bentham's act of watching—commonly adopted in surveillance studies—assumes a surveillant object, one that can be viewed, tracked, or monitored. The *meaningful surveillant object*, in other words, is perhaps one of the very fundamental assumptions made by surveillance scholars. This starting point however simplifies or altogether displaces typically conflictual social relationships—closely-knit communities and largely homogenous police forces, or first world nations and closed totalitarian ones such as North Korea. Such spaces and sites, however, challenge surveillance studies to integrate such panoptic-vacuums into a diagram of probability, one that increasingly monetizes or financializes "risky" social, economic and political relationships that are immune to surveillant mechanism. As I have argued elsewhere, however (Elmer and Opel 2008), such intelligence gathering is often an oxymoron, not only because it leads to uninformed actions (e.g. the preemptive invasion of Iraq, mass arrests of peaceful protestors, etc.), but moreover, because it *a priori* rejects instances where panoptic surveillance cannot be established—typically in particularly demographically tight-knit isolated communities (locally or globally).

Through the work of Deleuze, and the rejection of Bentham, conversely, surveillance studies can begin to question the economic rationalities of diagrammatic systems, the assigning of value to objects that may or may not be subject to a successful form of monitoring. The meaningfulness of networked objects of surveillance are never preconstituted, universal or equivalent, rather, as seen in the example of phone hacking by journalists in the UK in 2011, the surveillance and monitoring of individuals is subject to a broader financial and libidinal economy, one that targets valuable objects, information that can be resold and capitalized upon. Surveillance in this sense is subject to an economy that constantly seeks to rationalize relationships among people and things to better manage the future.

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b. Simulation and post-panopticism

William Bogard

Panoptic and post-panoptic studies of surveillance have both drawn heavily from French post-structuralist and postmodernist philosophies. Foucault's incisive analyses of panoptic environments, particularly in *Discipline and Punish: The Birth of the Prison* (1979), provided the basis both for a disciplinary understanding of surveillance, i.e. control of visibility in confined space, and what one could call a "control model" understanding in which electronic surveillance is the norm. There has been a lively theoretical debate over the extent to which historically the disciplinary model has been abandoned in favor of the control model, and how they differ, both conceptually and in practice (cf. Lyon 2007; Hardt and Negri 2004; Haggerty and Ericson 2000) (see also McCahill, this volume).

This debate, in turn, has fostered a discussion of the limits of panoptic control as a model for surveillance in societies that must track and manage digital information. Poster (1990), for instance, coined the term "Superpanopticon" to comprehend control today as an inflated form or higher register of panoptic surveillance. Haggerty and Ericson (2000) and Mann *et al.* (2003) have questioned whether the panoptic model remains useful at all for the modern theory of surveillance, given fundamental changes in the ways societies now obtain and use information. Drawing on Deleuze and Guattari's (1987) work, Haggerty and Ericson propose the concept of "surveillance assemblages" to describe the complex assortment of machines and procedures for extracting, sorting and delivering information today. What differs from the panoptic assemblage is the machinic architecture, which is now engineered to manipulate data objects in digital networks rather than physical bodies in confined spaces. In a somewhat different vein, Mann argues that the panoptic model cannot account for all the decentralized and non-hierarchical modes of surveillance operative today, in an era when technology is making it possible for everyone to watch everyone. He calls this state of affairs "sousveillance," in which surveillance comes from "below" as much as "above" and potentially constitutes a new mode of resistance to panoptic control.

A third model, the subject of this chapter, has focused on simulation as a post-panoptic control strategy. Baudrillard's (1994) work on the subject, and Deleuze's (1992) concept of "control societies," have provided insights into how the panoptic assemblage was limited by its rigid materiality and architecture (Bogard 1996). Simulations, by contrast, are composed of digital codes and offer flexible control that can serve multiple functions, from predicting complex system behaviors, to interactive and immersive training, planning and forecasting, profiling and preemptive intervention.

Simulation is a technology of truth and reality. In this respect it does not differ from panoptic control. According to Baudrillard (1994: 1), it is the reproduction of the real according to its model. Simulations do

not "represent" real events so much as manufacture hypothetical ones for specific control contexts, for example, the digital games that train soldiers in combat scenarios. Simulation, Baudrillard claims, "short-circuits" the normative relations of truth that hold between real events and their representation. In their idealized form, simulations are self-verifying, i.e. they are true and real in themselves. Baudrillard often describes simulations hyperbolically, as "truer-than-true" or "hyperreal," to draw attention to their non-representational status, as well as to the implications this has for the display and exercise of social power. We shall return to this below.

Panopticism, in contrast, is tied to a strategy of representation. According to Foucault (1979: 200–202), the goals of panoptic power are visibility and non-verifiability. Power must appear present to compel obedience, even if it is absent in fact. In Bentham's ideal prison, the architecture itself represents the reality and truth of power, irrespective of the presence of a human observer in the central guard tower. No observer is required for the machine to function, but this truth is masked. Visible and unverifiable, power is freed to expose and verify every movement within the enclosed and segmented space over which it rules. This, Foucault says, is a coercive strategy of truth—it aims to establish what is true and eliminate every-thing false (or abnormal, or merely apparent) and to accomplish this in populations confined in space and time and deceived as to the presence of power.

Baudrillard (1994: 6) sometimes characterizes simulation as a truth that masks an absence of truth. The panopticon, from that point of view, already functions as a complex assemblage of simulation, to the extent that power disguises itself by disappearing into its architecture. This assemblage fails, however, a failure tied to the limits of that architecture, specifically, to its model of enclosure.

We must be careful, Foucault says, not to confuse "enclosure" with "confinement" (cf. Deleuze 1992: 4). Enclosure, as a general control strategy, facilitates the accumulation of power and knowledge. It regulates flows between the inside and outside of the enclosure, for example, flows of bodies, information or contraband. But enclosure does not require material constraint. The physical interior of the panopticon may be a gentler enclosure than the dungeon, but confinement remains its technology. That technology offers an imperfect solution at best for a system that aims for the automatic function of power. Walls are permeable, they have openings, access points and exits of various sorts that are difficult to surveil. They are rigid and create hidden zones where resistance can fester. They concentrate populations and increase opportunities for collusions and intrigues. Finally, confinement cannot satisfy the expanding needs of capital for greater mobility of labor, speed of communication and risk management. All these failures have combined to produce a general crisis of panopticism.

Simulation does not confine processes to verify them. In fact, confinement becomes redundant for it, as in our example of soldiers who can be trained in virtual combat anywhere. In its ideal form, simulation reproduces truth "in advance" of its verification (Bogard 1996). This same ideal inspires the most mundane simulations to the most science fictional, from industrial process control to cloning—to control a process in advance by verifying it first in its model. This ideal or "imaginary" informs the development of all simulation technologies in use today.

What follows is a brief history of simulation from the period around the Second World War, seen as part of a more general movement from disciplinary to control societies. This is not to suggest that simulation, as a strategy of power, is recent. Its uses—to mask an absence, to verify an event in advance—extend back to the origins of military strategy. Sun Tzu, in the sixth century BC, for instance, wrote on the advantages of disguise in war, on the use of spies as simulators, whose secret lines of information could preempt battles and defeat enemies without a fight. Simulation entered philosophical discourse early. Both Platonic and non-Platonic traditions analyzed it, either as a false and dangerous imitation of truth, or as a mask that concealed truth (or its absence). It is not my purpose here to go into this long history, but to focus on the recent technical evolution of simulation that develops in response to the failure of panoptic control, a failure rooted in what has been called the crisis of the disciplines.

William Bogard

The crisis of the disciplines

For Foucault, disciplinary society was in crisis by the beginning of the twentieth century (Deleuze 1992: 3). In fact, the origins of the crisis were much earlier. They were present from the beginning of the disciplinary project that emerged in Europe in the seventeenth and eighteenth centuries. The disciplinary machine, Foucault writes, works like any machine, namely, by "breaking down," by failing to produce its ideal outcome—specifically, a "docile body," an "individual" that is trained, improved and made useful to the system (1979: 136). This failure is in fact manifest in the assemblage from the start, and serves a self-corrective function. In overcoming its failures by constantly reforming itself, the disciplinary apparatus expands its control over the body and the general population. Failure, in this sense, is not a negative outcome, but a productive function of the disciplines.

Deleuze (1992: 3) credits Foucault for recognizing the transience of disciplinary societies, that they "succeeded … the *societies of sovereignty*, the goal and functions of which were quite different (to tax rather than to organize production, to rule on death rather than to administer life)." But in turn, they were to be succeeded by the societies of control, the "new monster in our immediate future." The disciplinary model of enclosure ultimately proved too inflexible, unable to adapt itself to the demands of a changing economy for modulated controls over production. The result was a "generalized crisis in relation to all the environments of enclosure—prison, hospital, factory, school, family." These environments, Deleuze writes, are "interiors," fixed containers subjected to panoptic control. Interiors, however, cannot be sites of a mode of production that today demands decentralized, dispersed and mobile administration. This requires a new model of enclosure.

Deleuze (1992: 3) has summarized the ideal project of control that Foucault laid out in his histories of disciplinary institutions, "to concentrate; to distribute in space; to order in time; to compose a productive force within the dimension of space-time whose effect will be greater than the sum of its component forces." Confinement best facilitated these ends during the nineteenth century, when technologies for tracking individuals and population movements were limited by today's standards. In the abstract, control is a force that channels flows and if or how they cross the system's boundaries. Panoptic architecture, Bentham's famous design, represented a genuine advance in the efficiency of flow-control technologies over earlier ages. The elaborate system of walls and passages insured that populations of confined individuals would move in precise and predictable ways. But this system could not last, given the rapid exteriorization of productive forces in the twentieth century and its acceleration after the Second World War by advances in computerization, networks and methods of statistical modeling.

The technical logic that organizes control societies, according to Deleuze, is "modulation." Interiors are like "molds," rigid containers that shape their objects into a fixed and final form—in the case of discipline, this form is the modern "individual." Modulation, in contrast, does not work this way. In scientific terms, modulation is variable control over the characteristics of a wave. It is not applied to individuals but to oscillations, specifically, to "trends" or "tendential" movements that have defined statistical properties (we shall return to this). One form that modulation can take is statistical control, which adjusts production frequencies and amplitudes on the basis of small samples and standard deviations. This form of control does not depend on interiors, yet nonetheless operates as a form of enclosure. New techniques of statistical tracking (e.g. data mining), combined with remote control technologies, allow certain production processes to be regulated without concentrating them behind walls or allocating them to specific institutional spaces. Such is the case, for example, with work involving quality control, inventory, risk assessment and coordination of complex component assembly lines.

What is true for space is also true for time. In disciplinary societies, interiorization is accompanied by rigid temporal controls. Linear time, Deleuze (1992: 4–5) writes, structures production both inside disciplinary institutions—for example, the work line of the factory—and between them. When one is at work, one is not at school, or the barracks, or at home, always being transported from one rigid container to the next. Linear sequencing of production, in which each phase follows its immediately preceding one,

may mark an advance in control technology at the beginning of the industrial age, but it becomes a fetter in network society, which demands phasing of multiple temporal sequences simultaneously, often in non-linear ways (multi-tasking).

A mold cannot alter its form, and the object it produces is fixed. Modulation control adapts to the deterritorialization of productive forces that marks the shift from industrial to network organization in contemporary society. Rather than generate a fixed object, the individual, an enclosure that modulates can vary its structure and the product it produces in response to changing contingencies of production, for example, those generated by the speed and complexity of modern communications, or the rapid flux of global markets.

All these changes culminate in a crisis of panoptic control grounded in its inability to regulate modern productive forces. Panopticism was a limited program designed to keep watch over confined populations, not organize the mobile labor forces and financial flows of complex information economies. Simulation is a flexible response to these problems, a tendential control technology that replaces rigid controls on visibility in enclosed interiors (and their associated temporal controls) with modulated control by models, codes and new methods of social sorting. What follows traces historical developments in simulation and their connection to post-panopticism in the sociology of Jean Baudrillard, who views these developments in terms of a shift in the representational function of sign systems in the twentieth century.

A short history of simulation

Although simulation has a long history, the focus here is on how it develops as a technology and strategic model of control in the period around the Second World War, specifically as it relates to the emergence of control societies following the collapse of the confinement model. Even here, however, some historical background is necessary.

Modern simulation has its origins in statistical estimation and sampling methods devised by Leclerc and Buffon in the eighteenth century, which enabled minimal data collected on populations to generate models of their behavior. Not surprisingly, given its long history in warfare, the first modern applications of simulation were military, in the development of models to improve the accuracy of artillery and aid in logistics and combat preparation (see Wilson, this volume). In Europe, statistical estimation also supported economic production. The small samples required for simulation models served to reduce the need for surveillance of every event and allowed the control function to be positioned more squarely at the input phase of a process rather than its output. Statistically representative data substituted for blanket and often ad hoc collection of information. In these early statistical formulations, there is a harbinger of many current forms of simulation control, from risk assessment, to profiling, data-mining and financial speculation. By the end of the nineteenth century, these techniques were being applied to quality and process control problems in the field of industrial engineering. By the middle of the twentieth century, they were used to assist in the development of nuclear weapons (Stanislaw Ulam's work with Edward Teller). In applications of game theory and other statistical modeling tools, numerous lines were drawn between the commercial and military applications of modern simulation.

In locating the roots of modern simulation in statistical reason, we should not forget that it has a mechinic history as well, oriented to training functions. Early in the twentieth century, the first simulated cockpits for flight instruction appeared. The importance of simulation was recognized from the beginning of manned flight. Aircraft themselves initially served to instruct pilots, but mock cockpits reduced costs, generated efficiencies of scale and gave flexible control over training times, places and risk.

Early flight simulators used devices to make the training experience more "realistic"—to tilt cockpits, simulate turbulence, convey stalls and lifts and the feel of real controls. The Second World War accelerated these developments as the need for pilots exploded. As aircraft grew in complexity and size, so did flight simulators, and as wars grew in complexity, simulators were designed to train not just pilots, but all manner of military personnel.

Statistical reason, of course, was also embodied in these machines. To train pilots for both routine operations and emergencies, simulators were engineered to produce deviations from normal functions and allow for corrections. They had to function within parameters that specified statistically normal flight conditions, measured and responded to variances and differences in operator inputs, and so on. The technologies were only as good as the estimation models that governed their behavior.

In the 1950s and 1960s, mathematical engineers articulated the two central problems of digital simulation: the construction of the simulation and its application. Strategically, one must first design a simulation experiment, then tactically determine how to run the simulation as specified in the design. The challenge of simulation modeling is to predict the output of complicated systems. Such output is almost never independent or normally distributed. Work on statistical distribution problems in the period between the Second World War and the 1980s focused on standardized time series, initialization biases, selection, ranking and optimization problems. Application-driven simulation increasingly found its way into the manufacturing and telecommunications sectors by way of the military.

In the 1960s, general purpose simulation systems were designed to facilitate rapid modeling of telecommunication systems used, for example, in urban traffic control, telephone-call interception and switching, airline-reservation processing and steel-mill operations. Models such as these also played key strategic roles in Cold War deterrence, assisting in assessments of technical, military and political capabilities of superpower rivals. Simulation also offered a means, in conditions of limited information on a rival's specific economic plans, to predict and control flows of capital, and to manipulate labor markets and financial transactions.

In all these developments, simulation provided tools for overcoming limits of control embedded in the panoptic model, limits tied to its form of enclosure and its conceptions of truth and reality. In the 1980s and 1990s, these problems were taken up by the sociologist/philosopher Jean Baudrillard, whose work remains one of the still relatively few sources of critical reflection on the socio-cultural implications of simulation control.

Baudrillard on simulation

Simulations are types of signs, and their philosophical study draws on semiotic and post-semiotic theory. Much of Baudrillard's work contributes to this general literature, but adds some distinctive twists. His most well known analysis in *Simulacra and Simulations* (1994) relates simulation to post-panoptic control. This work has been criticized for its eclectic blend of social theory, philosophy, history, fact and fiction. But its analysis of emerging control technologies was astute for its time, and it remains the most original and cogent work we have to date on the socio-political implications of simulation control.

Typically, simulations are defined as false or deceptive signs, but Baudrillard radicalizes this view. He asserts that, as simulation ascends to a dominant position in postmodern societies, the sign's traditional function of representation, i.e. its power to "mirror reality" and separate it from false appearances, comes to an end, along with its role in the organization of society. In part, this is a consequence of technological change, in part a function of the internal logic of signs themselves, i.e. to break free from their signifieds. Panoptic space, Baudrillard argues, in contrast is *representational*, a field of relatively fixed significations, and also *perspectival*, an orientational space that organizes the way objects are displayed. Simulation replaces both. What we witness with current simulation technology is, from the point of view of sign systems, a new semiotic of control, one founded not on truth relations between a sign and the reality it purports to represent, but on the radical indeterminacy of those relations. The utopian goal of simulation, according to Baudrillard, is not to reflect reality, but to reproduce it as artifice; to "liquidate all referentials" and replace them with signs of the real. The truth of the sign henceforth is self-referential and no longer needs the measure of an independent reality for its verification. Sign systems constitute their own reality, or as Baudrillard says, they become "hyperreal."

Simulacra and Simulation was originally published in 1981, when the digital assemblages we take for granted today were just emerging—social networks, GPS, virtual and augmented reality. In one section, it uses a now dated example of the vérité experience of reality television to illustrate the demise of panopticism. In 1971, an American documentary placed the "private and unscripted" daily lives of a "real" family (the Louds) on display for seven months for all to observe. Baudrillard notes, however, that the "truth" and "reality" of the family were simulations. The Louds went about their life "as if" the cameras watching them were not there. And the viewing public watched "as if" it was secretly spying on something private. Both were complicit in the illusion. It was an illusion that nonetheless produced "real" effects. The constant presence of the cameras provoked family conflicts during the filming, even though those conflicts could not be attributed to that presence without sacrificing the illusion. Baudrillard notes that, along with principles of truth and reality, the simulation also upset clear lines and common attributions of social causality. In the final analysis, he declares, it was indeterminate whether the broadcast images of the Louds represented the real causal dynamics of the family, or merely the perverse effects of television.

Baudrillard multiplies such examples, but, for him, all point to the close of the panoptic era, which "still presupposes an objective space (that of the Renaissance) and the omnipotence of the despotic gaze" (1994: 29). Although critical of Foucault's analysis of panoptic space, which he insists reifies the concept of power, Baudrillard shares Foucault's sense that the panoptic model of enclosure and its disciplinary logic are historically finished. The discipline enforced by panoptic surveillance evolves into a general "system of deterrence," in which submission to a centralized gaze becomes a general codification of experience that allows no room for deviation from its model. In post-panoptic society, subjectivity is not produced by surveillance in the conventional sense of hierarchical observation, but by codes intended to reproduce the subject in advance. It is no coincidence that Baudrillard often draws on examples of genetic engineering and cloning to illustrate the logical, technical and human horizons of simulation control.

Baudrillard does assert that simulation entails the "end" of the panoptic model. At the same time, his conception of simulation as "hyperreality" allows for the interpretation that panoptic control has not disappeared altogether in the new information order, but in fact has shifted into a higher register. Baudrillard, for example, asserts that measures that organized the prior order of signs are reduplicated in simulation in the present order. Thus, representation does not exactly disappear as a force in control societies, but rather becomes "simulated" representation (virtual reality can be conceived in this way); power does not vanish, but becomes simulated power, no longer instantiated and invested in the real, but rather reproduced in codes and models. Extending this logic, the visible spaces organized by the panopticon become the data mines and information clouds of post-disciplinary societies, accessed not by doors, locks and keys, but by passwords, pin numbers and decryption tools. The forces of verification, far from succumbing to the general crisis of truth that marks the failure of the panoptic machine, now operate more comprehensively, antecedent rather than subsequent to events. It is in this spirit of reading Baudrillard that has led Bogard (1996) to describe postmodern control as "simulated surveillance," or surveillance as modeling. If and when simulation control becomes able to model the full range of contingencies for a predesignated range of events and control for them, surveillance will have achieved its most comprehensive expression. Every unfolding process that occurs within a defined set of parameters will be pre-screened and accounted for in advance. Such are the "dreams" of control society engineers who design virtual training systems, or who develop cloning technologies and artificial intelligence systems. It is the "reality principle" that is at stake in these changes, not reality itself. In control societies, surveillance is not governed solely by the imperative to represent reality, but to assist in the construction and application of models. What is monitored first of all is information on the performance of the model, and not the event it models.

The panopticon is a "medium" for channeling flows of information and bodies. It is a concrete assemblage consisting of lighted passageways, walls, entries and exits, and an apparatus for recording all that passes in and out of the assemblage. It is the dematerialization of this medium that Baudrillard claims is a hallmark of post-panoptic society. Hardt and Negri (2004) have theorized the dematerialization and growing

abstraction of media of control in post-panoptic societies, as the information network rather than industrial production becomes the dominant model for organizing society. A parallel way of thinking about this development is through the language of "surveillance assemblages" (cf. Haggerty and Ericson 2000). Assemblages, in Deleuze and Guattari's (1987) formulation, are multiplicities of interconnected machines, some of which are concrete (e.g. surveillance hardware, bioware technology), others abstract and immaterial (codes, models, statistical formulae, data). As it has evolved in control societies, the surveillance assemblage increasingly operates as a system of deterrence that manages the immaterial functions of networks. Of course, the material technology of surveillance remains important—networks are still composed of interconnected computers, communication lines and information storage devices. Currently, however, developments in network technologies point to the progressive elimination of physical media, as communications become wireless, as data storage becomes the function of information "clouds" and as tracking of individual and population movements no longer demands their visibility but continuous global positioning and statistical estimation. Eventually, so the science fiction scenario goes, the external medium of surveillance will dematerialize entirely with advances in genetic coding and engineering.

Finally, Baudrillard claims that the collapse of the reality principle in simulation reverses the causality of panoptic control, indeed the whole causal logic of discipline insofar as it constitutes a machinery of judgment. In the disciplinary machine, verification precedes judgment. Although it aims to produce automatic obedience, panoptic surveillance nonetheless reacts to events—it notices, identifies and categorizes them before passing this information on to authorities that determine its ultimate significance. In control societies, however, judgment is far more proactive. The simulation model structures the event's production and meaning, and passes judgment in advance. Surveillance is relegated to a secondary function and is only there to monitor the performance of the model. It is as if the whole causal sequence of social judgment had been reversed to mirror the Queen's demands for justice in *Alice in Wonderland*:

> 'Let the jury consider their verdict,' the King said, for about the twentieth time that day.
> 'No, no!' said the Queen. 'Sentence first – verdict afterwards.'
> 'Stuff and nonsense!' said Alice loudly. 'The idea of having the sentence first!'
> 'Hold your tongue!' said the Queen, turning purple.
> 'I won't!' said Alice.
> 'Off with her head!' the Queen shouted at the top of her voice. Nobody moved.
> 'Who cares for you?' said Alice, (she had grown to her full size by this time.) 'You're nothing but a pack of cards!'

If surveillance still performs a juridical function in social control today, it is more likely to be located on the side of the execution of the sentence, which ideally comes prior to the announcement of the verdict. No verification procedure is necessary to render a verdict for a judgment already made. Verification, so to speak, is complete. Reality checks that would interrupt this sequence are performed in advance and any problems are deterred in advance. Henceforth, surveillance functions to serve the application of the simulation model, to insure the model's initial conditions are correctly specified and that its run unfolds according to plan. It is not asked to extend beyond the parameters of the simulation. Thus, as it develops as a means of control in post-panoptic society, surveillance is severed from the very reality principle it was originally set up to enforce.

The future of simulation

Baudrillard's hypotheses about simulation control are deliberatively hyperbolic and speculative. The future trajectory of any technical assemblage is always uncertain. The technologies we imagine on the horizon rarely resemble or function like the ones that actually emerge. This is undoubtedly true of simulation technology in a post-panoptic world. Nonetheless, we might glean some trends from present developments.

One thread in the evolution of simulation technology is *convergence*. Historically, different uses of simulation have developed in relatively independent ways. The demand for applications that serve more than one audience and/or more than a single function has led to the merger of once distinct simulation approaches. One example of interest to the military, where many ideas for control technologies originate, is the convergence of live, virtual and constructive (LVC) simulation for training purposes. Increasingly this has come to include forms of augmented reality.

Gaming, of course, is one area of intensive development, one that also has benefitted from military applications. Computer-based games combine simulation and entertainment. They have been commercially profitable and led to the production of lower-cost information delivery platforms that have high performance computing and graphics. Trends point to the insertion of more instructional tools into game simulations, following the military example above.

Simulation aims at the replication of experience. From flight simulators to retinal laser technologies that produce images directly on the eye, the substitution of virtual for real experience has been a project of simulation research and development. *Haptic control* is perhaps one of the more fantastic applications of simulation technology. It is a means of flexible enclosure, in contrast to confinement, to return to the theme that began this chapter. Haptic simulation involves not just the simulation of touch, as its name might imply. Rather, it is a technical and social program for the replication of sensibility as a whole, including the body's proprioceptive awareness, the internal sense of its own position and movement relative to the external world. Part of this program does involve the development of technologies that reproduce or simulate the sensation of touch, but the full project of haptics is simulation control of the whole continuum of affective experience.

The term "haptics" comes from the Greek for the ability *to make contact with*. Unlike information control that requires a confined population, or a dispersed population under passive surveillance (such as CCTV), haptic technologies respond to the active body and supply it with tactile feedback. The program of haptics is straightforward: simulate the body's sense of acting in the real world.

Haptic interfaces simulate the feel of objects, their texture, surface resistance, bulk, edges and gaps. Datagloves that react with vibratory stimuli to users' handling of simulated objects, for instance, are a classic example of a haptic technology. Current applications include locomotion devices for navigating virtual worlds (updated treadmills), orthopedic equipment, touch-screen technologies, tele-operators (remotely controlled robots), diagnostic tools for measuring or producing pressure and resistance, density, heat and other intensive parameters, and, of course, computer games that provide gamers with various kinds of vibrational or positional feedback.

In all these developments of simulation control, we have moved far beyond what the panoptic model of surveillance developed in the classical age was capable of explaining.

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