

Disposition

Highways, first promoted with stories about freedom and uninterrupted movement, possessed an organizational logic that actually caused congestion. ARPAnet, first characterized as a stealth network for the military, lent itself to the kinds of exchanges that finally generated the internet. Promises of decentralization accompanied the first electrical utilities, just as promises of open access have accompanied contemporary broadband networks. Yet both networks, at certain junctures in their evolution, have sponsored constricting monopolies, whether scattered or centralized. The mass-produced suburbs sold unique country homes but delivered the virtually identical products of an assembly-line organization. Facebook, a platform created for social networking on a college campus, revealed another initially unrecognized potential when, in the Arab Spring, it was used as an instrument of dissent. Likewise the zone, created and promoted as a tool of free trade and economic liberalism, has often produced closed, exurban enclaves.

In all these cases, some of the most consequential political outcomes of infrastructure space remain undeclared in the dominant stories that portray them. Information resides in the technologies—from telecommunications to construction—as well as in the declared intent or story—from decentralization to stealth. Yet information also resides in a complex of countless other factors and activities. All these activities, taken together, lend the organization some other agency or capacity—a disposition—that often escapes detection or explanation.

Reading disposition in infrastructure space is like Twain's reading of the water's surface. The shiny new technology or the persuasive promotional story may command attention just like the pretty landscapes of the river, but in excess of that material, spatial organizations are always providing information about their inherent, if undeclared, activities. While beyond complete comprehension, disposition describes something of what the organization is doing—activities that may diverge from the stated intent. This misalignment with the story or rhetoric is one means of detecting disposition, but additional organizational attributes are also helpful in assessing it.

Perhaps the idea of disposition is not really so mysterious. A ball at the top of an inclined plane possesses a disposition.¹ The geometry of the ball and its relative position are the simple markers of potential agency. Even without rolling down the incline, the ball is actively doing something by occupying its position. Disposition, in common parlance, usually describes an unfolding relationship between potentials. It describes a tendency, activity, faculty, or property in either beings or objects—a propensity within a context.

Infrastructure space possesses disposition just as does the ball at the top of an incline. Few would look at a highway interchange, an electrical grid, or a suburb and perceive agency or activity in its static arrangement. Spaces and urban organizations are usually treated, not as actors, but as collections of objects or volumes. Activity might be assigned only to the moving cars, the electrical current, or the suburb's inhabitants. Yet the ball does not have to roll down the incline to have the capacity to do so, and physical objects in spatial arrangements, however static, also possess an agency that resides in relative position. Disposition is immanent, not in the moving parts, but in the relationships between the components.

When navigating the complex dispositions of a river, dimples or ripples on the water serve as markers; and when navigating or hacking the complex dispositions of infrastructure, some simple

markers are equally useful. The infrastructural operating system is filled with well-rehearsed sequences of code—spatial products and repeatable formulas like zones, suburbs, highways, resorts, malls, or golf courses. Hacking into it requires forms that are also like software. Different from the object forms of masterpiece buildings or master plans, these active forms operate in another gear or register, to act like bits of code in the system. Active forms are markers of disposition, and disposition is the character of an organization that results from the circulation of these active forms within it. Since these forms are always changing, as is the complexion of disposition, they cannot be catalogued as elemental building blocks or terms in a glossary. Rather, identifying just a few among the many active forms that might be manipulated, redesigned, or rewritten only begins to crack the code, making more palpable the dispositions they inflect and providing some instruments for adjusting political character in infrastructure space. Still, as signs of ongoing processes—like the ripples used for river navigation—the practicality of these forms relies on their indeterminacy.

An important diagnostic in the fluid politics of extrastatecraft, disposition uncovers accidental, covert, or stubborn forms of power—political chemistries and temperaments of aggression, submission, or violence—hiding in the folds of infrastructure space.

Active Forms

Multiplier

A field of mass-produced suburban houses is a common phenomenon in infrastructure space, and it is an organization with clear markers of disposition. In the case of the US suburb of Levittown, the developer did not set out to make 1,000 individual houses, but adopted a kind of agricultural method of house building—1,000 slabs, 1,000 frames, 1,000 roofs, and so on. The site was effectively an assembly line separating the tasks of house building into smaller activities each of which could be applied across the entire population of houses in sequence. Beyond the activity of the humans within it, the arrangement itself rendered some things significant and others insignificant. The organization was actively *doing something* when it directed urban routines. It made some things possible and some things impossible (e.g., the building of an individual house different from all the others). There were different kinds of form involved: the object form of the house and the active forms that organized the components of the field. Levittown was simple software, and one obvious marker or active form in its organization was the multiplier. The house was not a singularly crafted object but a multiplier of activities. The developer, William Levitt, turned the site into an assembly line and the homes into a population of commodities, from their frames and roofs to their TVs and washing machines.

Redesigning a single house, or the object form of the house within the suburb, may not be as powerful as addressing the active form—in this case a multiplier. A designer who intervenes in the repetitive fields of suburban space with a single house will have little impact. But designing something to be multiplied within a population of houses has the potential to recondition the larger suburban field or hack the suburban software. For instance, when the car arrived in suburbia, it was a multiplier that required a garage to be attached to every house, and today recalibrating or reconceiving the car and its garage would multiply and spread spatial changes throughout a field of houses. More powerful than a single object form in these landscapes, multipliers piggyback on repetitive components.

The city grows or changes because of the multipliers that circulate within it—cars, elevators,

mobile phones, laws, real estate formulas, structural innovations, and security technologies among them. Just as the car is a multiplier that determines the shape and design of highways and exurban development, the elevator is a simple example of a multiplier that has transformed urban morphology. In the late nineteenth century, the elevator, together with the stackable floors of structural steel skeletons, made vertical buildings possible. Those that first appeared in Chicago and New York have evolved into the modern skyscraper—a prevalent spatial product in cities around the world. The elevator's propagation, rather than its movement up and down, makes it an active form with a disposition to multiply in urban environments. Since the elevator carries the genetics of the skyscraper, altering its routines potentially has collateral effects. For instance, contemporary elevator technologies that experiment with horizontal as well as vertical movements are the germ of a very different urban morphology. The designer who deploys a new conveyance vehicle may not design the vehicle itself but the way in which it propagates in and rewrites the urban landscape.

The presence of a multiplier is not the only reason why a mass-produced suburb does not deliver on its promise of a leafy country home, just as the elevator, as multiplier, is not the only reason for the urbanity of a city like New York or the isomorphism of the zone skyline. The multiplier is only one active form, one factor in assessing or adjusting a disposition, but it is present in almost all of the software of infrastructure space.

Switch/remote

In addition to the multiplier, another common active form in infrastructure space is the switch. An interchange in a highway network acts like a switch. A dam in a hydrological network, a terminal in a transit network, an earth station in a satellite network, or an internet service provider in a broadband network are all switches. Like the ball on the inclined plane, they establish potentials. Like a valve, they may suppress or redirect. The switch may generate effects some distance down the road or the line. It is a remote control of sorts—activating a distant site to affect a local condition or vice versa. Exceeding the reach of a single object form, the switch modulates a flow of activities. However deliberate the activities of the switch, it cannot control all of its own consequences any more than one could account for every use of the water flowing through a dam.

Infrastructure space is filled with switches and remote controls, most of which are also multipliers repeated throughout the system, and tuning these active forms tunes the disposition of an organization. For example, at the end of the nineteenth century and in the first part of the twentieth, the electrical networks that spread across developed countries promising decentralized access to power were often actually composed of a patchwork of local utilities—powerful nodes or switches in the network that had controlling monopolies.² In the development of telegraph, telephone, and fiber-optic submarine cables, any landing point for the cable acted like a switch in the network that could similarly develop a monopoly and affect onward service and pricing. In both cases, generating redundant switches in the form of multiple cable landings and multiple service providers potentially gave the network a more competitive and more robust disposition.

A typical highway interchange offers only a change of direction at constant speed. It is a switch in the network, but not a very smart switch. In traffic engineering, it was believed that statistical evidence of larger and larger populations of cars warranted more and more lanes of traffic. Yet increasing capacity only increased congestion, in part because of inadequate switches. Tuning the switches in the network would be one way of addressing the fallacies of the traffic engineering interchange. Volumes of traffic, like those in rush hour, could best be handled by the larger capacities of mass transit. A smarter, more resilient transportation interchange or station might then offer an

intermodal switch between highway, rail, air, and mass transit.

The character of the switches in electrical or highway networks is not the only reason why they can foster monopolies or congestion. But in each case the switch is one active form—one lever or dial in determining unanticipated dispositions in the networks.

Wiring/topology

The Königsberg Bridge Problem started with a bet in a pub. The challenge was to find a route through the eighteenth-century Prussian city of Königsberg that went from the city's central island and back again without crossing any of its seven bridges more than once. In 1735, the mathematician and physicist Leonhard Euler demonstrated that there was no possible route satisfying that criteria. In doing so, he developed a mode of analysis fundamental to contemporary thinking about network topologies—expressions of relative position and sequence in a network. Topologies model the “wiring” of an organization. It is perhaps telling that topological thinking originated with a game about circulating through urban space. Just as an electronic network is wired to support specific activities, so can space be “wired” to encourage some activities and routines over others.

Topologies are intuitive markers of disposition in an organization, and they can be considered to be assemblies of multipliers and switches. Just as we know the potential of the ball at the top of the incline, we are familiar with the potentials and capacities of networks that have, for example, linear, multi-centered, radial, serial, or parallel topologies. A linear network connects successive points along a line, as in the case of a bus, a train, or an elevator that connects sequential floors. The disposition of a linear rail system or a linear fiber-optic cable buried in the ground is different from the disposition of an atomized sea of mobile telephones. In a radial, or hub and spoke, network, like massmedia television or radio, a single central point controls the flow of information. Mainframe computing was a serial network that passed information sequentially, while a parallel network might be modeled as a more open mesh with information flowing simultaneously from many points.

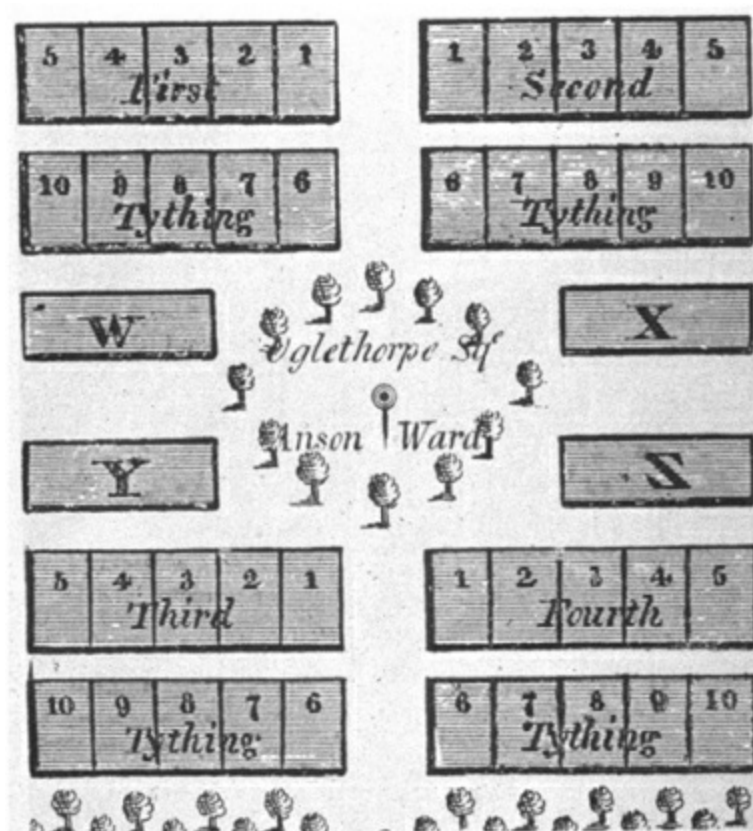
Topologies are also markers of political disposition insofar as they highlight the ways in which the authorities circulate or concentrate information. In the United States, the patchwork of local electrical utilities that generated a scattering of monopolies and inefficiencies was eventually absorbed into larger centralized monopolies like General Electric and Westinghouse. The internet, often theorized as an open mesh in which every point in the network can reach every other point, may really be more like a multi-centered organization. Sites like Google or Facebook may either help to filter information, making the web more salient and less chaotic, or shape an internet that operates more like a utility network with monopoly control.³ While portrayed as relaxed and open, the zone enclave often assumes the disposition of a closed loop that will only recirculate compatible information. Yet mapping some of the zone incentives onto the city potentially changes its wiring and disposition, inviting more channels of information, circumstance, and contradiction that are the hallmarks of open, public urban space.

Again, although a contributing factor, topology alone does not determine the disposition of an organization. The same topology can sponsor very different kinds of social and political activity. Disposition in infrastructure space almost always involves compound conditions, relying not just on multipliers, switches, or their topological arrangement. It can be modeled as a network or as an *interplay* of many different kinds of active forms to create increasingly complex spatial software.

Interplay/governor

In 1733, James Oglethorpe designed a scheme for the New World city of Savannah, Georgia. To

control real estate speculation and damage from fire, he produced not a graphic master plan—a plat or a complete set of rectilinear blocks—but rather a growth protocol or governor that established relationships between different species of urban space. The town was to grow by wards, each of which was to contain a ratio of lots to green open space. A percentage of the lots around the green, called tythings, were reserved for residential and commercial properties, while another percentage was reserved for public or civic functions. For each ward that was developed, a quotient of agricultural space outside of town was automatically reserved. The ward was at once a multiplier and, like a calculus function, an expression of variability and interdependency where components balanced and offset each other. The Savannah protocol provided explicit geometrical instructions for each ward, but the pattern of accumulated wards could evolve without having to determine a fixed boundary or master plan of the town.



Typical ward, Savannah, Georgia

Savannah provides a vivid example of a suite of active forms, like multipliers and remotes, linked as interdependent variables in simple but sophisticated software that regulated an urban disposition. The growth protocol was like a governor in an engine or a thermostat that modulated the relative proportions of public, private, open, and agricultural space over time. It could direct not only additional development but also its cessation or contraction. Different from an object form, the Savannah software established the terms of an interplay between spatial variables.

The golf course community—another quintessential global spatial product—involves an interplay of active forms that, like the Savannah software, links interdependent spatial variables to perform as a governor. If the goal of Savannah was to control speculation, the goal of the golf course suburb or any spatial product is to maximize profit. Two crucial interdependent variables are the debt incurred from creating the golf course and the surface area of the course itself. The surface area determines the number of lots for course-side golf villas that can be sold to offset the debt incurred in constructing the course. The surface area governs the shape of the course and vice versa. Securing a celebrity

endorsement from the likes of Jack Nicklaus or Arnold Palmer adds 15 percent to the value of each villa—just one of many variables in the game the developers play. While the appearance of the course is important, the object form is less important than its software—the powerful bits of code underlying millions of acres of development all around the world.

Many active forms circulating in the software that makes up infrastructure space can be used to hack that software. While not offering comprehensive control over an organization, active forms can nevertheless be inserted to counterbalance or redirect a disposition. They can multiply across a field, recondition a population, or generate a network. Like *cosx* or the mathematical *delta*, they can be part of an explicit expression for one way that the field changes. Active forms establish a set of parameters for what the organization will be doing over time. They have time-released powers and cascading effects. When the object of design is not an object form or a master plan but a set of instructions for an interplay between variables, design acquires some of the power and currency of software. This spatial software is not a thing but a means to craft a multitude of interdependent relationships and sequences—an updating platform for inflecting a stream of objects. Like the engine of interplay that philosophers Gilles Deleuze and Félix Guattari call a “diagram,” an active form does not represent a single arrangement. It is an “abstract machine” generative of a “real that is yet to come.”⁴

As the levers of disposition in infrastructure space, active forms, in different linkages and interplays, are tools of extrastatecraft.

Knowing That and Knowing How

Ascriptions of dispositions are actions.—Ludger Jansen⁵

Most urban and architectural designers—perhaps reflecting sentiments of the broader culture—are trained to work on object forms or master plans rather than active forms in interplay. When summoned to create an active form, designers naturally rely on what they are best trained to create—a formal object *representing* action or dynamic process. A more simple-minded confusion (made more powerful by being simple-minded) arises when action or activity is confused with movement or kineticism. A building is shaped to suggest a dynamic blur of motion, or the circulation of inhabitants is mapped with a blizzard of arrows. The more complex or agitated these tracings, the more “active” the form is seen to be. Or, reflecting a modernist faith in the succession of technologies, the form might be considered to be active only if it is coated with the newest responsive digital media.⁶

The distinction between form as object and form as action is something like philosopher Gilbert Ryle’s distinction between “knowing that” and “knowing how.” With characteristic clarity and simplicity, Ryle once explained the difference between the two by using the example of a clown. The clown does not possess the correct answer to the question, “What is funny?” The clown’s antics are not a single reasoned executive order. His knowledge and experience unfold in relation to the situation, from encounter to encounter, circumstance to circumstance. He has well-rehearsed knowledge of how to do a pratfall, exaggerate his facial expressions, modulate his voice, or introduce any other gag from his bag of tricks. What is funny involves a set of choices contingent on the audience’s reactions, and the clown’s performance relies on “knowing how” rather than “knowing that.” For Ryle, the clown’s skill represents “disposition, or a complex of dispositions.”⁷ “Knowing how” is, for Ryle, *dispositional*.⁸

Ryle's contemplation of disposition supports his broader critique of the mind-body split—a consequence of what he regarded to be the false logics of Cartesian dualism. He relished the fact that he often had to look no further than expressions in everyday speech to find the most withering challenges to these logics. Intelligence is often measured in terms of the amount of knowledge that can be acquired, identified, or named. Yet, as Ryle points out, a skill is not a logical proof that can be correctly or incorrectly reasoned. He argues for an intelligence or way of knowing that has to do with *knowing how* in mind and body. “A soldier does not become a shrewd general merely by endorsing the strategic principles of Clausewitz; he must also be competent to apply them. Knowing how to apply maxims cannot be reduced to, or derived from, the acceptance of those or any other maxims.”⁹ Addressing the designer, Ryle might have said that the object form of a master plan betrays a desire for *knowing that*, while a growth protocol like Savannah that unfolds over time exhibits a desire for *knowing how*. In infrastructure space, to ask “what is the master plan?” is like asking “what is funny?”

With simple examples Ryle demonstrates that disposition is something we already understand given that we use dispositional expressions to explain many common phenomena in everyday life. Ryle cites Jane Austen's changing perspective on the dispositions or temperaments of her characters as each novel unfolds. Only multiple observations of a person dealing with events over time can provide clues to their likely behaviors.¹⁰ He also notes that non-human objects possess disposition. Only multiple deformations of rubber signal the material's disposition to elasticity, and only after time can one observe that it has lost its elasticity.¹¹ Just as the ball that does not need to roll down the incline, glass does not have to be shattered in order to be brittle. There is no need for movement or event. Disposition remains as a latent potential or tendency that is present even in the absence of an event. To “possess a dispositional property,” Ryle writes, “is not to be in a particular state, or to undergo a particular change; it is to be bound or liable to be in a particular state, or to undergo a particular change, when a particular condition is realized.”¹² It is a “hypothetical proposition” about the glass different from an event or “episode.”¹³

To assess disposition is to assess how an organization deals with the variables over time—how it absorbs or deflects the active forms moving within it. Disposition does not describe a constant but rather a changing set of actions from which one might assess agency, potentiality, or capacity. Considering disposition to be determinate would be impractical. For Ryle, it is a subject of some mirth that dispositional attributes are sometimes regarded as fuzzy imponderables because they cannot be reified in an event or name. Ryle refutes those theories that associate disposition with “occult” agencies or regard things like the unshattered glass as temporal processes that are in “a sort of limbo world.”¹⁴

Architecture and urbanism might have been a subject of Ryle's sport. Treating active forms and dispositions as mysterious, unknowable conditions that cannot be legitimized as objects or representations risks losing access to the enormous political power residing in infrastructure space.¹⁵ The designer is left, for instance, trying to address a machine for making golf villas with a single house, or a volatile landscape with a master plan.

Active form is not a modernist proposition; it does not replace or succeed object form but rather augments it with additional powers and artistic pleasures. The potential for both kinds of form is always present in any design. Using either is an artistic choice. Active form may partner with and propel object form determining how it will align with power to travel through infrastructure space. A design idea for suburbia becomes more powerful when it is positioned as a multiplier that affects a

population of houses. An urban scheme designed as a governor has a greater likelihood of remaining in place to influence growth.

Active forms, while perhaps under-rehearsed in the design disciplines, are quite ordinary in many others. A geneticist cannot represent all the gene sequences of DNA with an image of a double helix but can engage the ongoing development of an organism with an active form that alters one of those gene sequences. An environmentalist does not attempt to manage a forest by wiring every bird in every tree or planting every sprig of undergrowth, but will send in instrumental players that inflect ecologies over time. Entrepreneurs design not only the product but also its passage through a market, perhaps using a mobile phone network or a repetitive suburb to multiply products and desires. A computer scientist would never attempt to fully represent the internet but would rather author active forms that ride the network with very explicit instructions. In all these examples, there is no desire for a singular, comprehensive or utopian solution. Power lies rather in the prospect of shaping a series of activities and relationships over time.

The extrastatecraft of infrastructure space is artistically and intellectually attracted to the idea of designing action and interplay as well as designing objects. Even though design orthodoxies may favor a training in *knowing that*, some of the real power players in the world, for whom infrastructure is a secret weapon, would never relinquish their faculties for designing both object and active form—for *knowing that* and *knowing how*.

Temperament

When the social scientist and cybernetician Gregory Bateson referred to a man, a tree, and an ax as an information system, he made self-evident the idea that the activities of infrastructure space can be a medium of information. For those like Bateson who foretold the digital revolution but were not yet completely surrounded by digital devices, it was perhaps easier to understand that anything—human or non-human, digital or non-digital—could be a carrier of information. Like Ryle, Bateson did not regard this activity to be “supernatural” or occult, but rather saw information as an ordinary currency for exchanges between humans and non-humans.¹⁶ “Information is a difference that makes a difference,” he famously wrote.¹⁷ Objects do not need to be enhanced by digital technologies or coated with sensors. To the degree that they “make a difference” in the world, they create influences, intentions, and relationships that constitute information. The information manifests, not in text or code, but in activity.

Bateson’s work also tutors an understanding of the active forms that manage information in infrastructure space. He wrote about “governors,” like those found in a thermostat or a steam engine, as mechanisms for modulating information—the temperature or pressure in a system—just as Savannah was a governor for modulating real estate speculation. Of switches, he wrote that a switch is a thing that “is not.” In other words, the switch controls a dispositional flow of changes—a flow of information. “It is related to the notion ‘change’ rather than to the notion ‘object.’”¹⁸

While Bateson’s more comprehensive cybernetic speculations about homeostasis in organizations are perhaps to be avoided, his work further deepens an understanding of disposition with its speculations on temperament or political bearing—the tension, violence, stability, or resilience immanent in organizations. Bateson’s catholic intelligence ranged across mathematics, communication technology, neurophysiology, game theory, and logic and did not subdivide the world into the subjects of different sciences. Assessing any subject with this cybernetic epistemology—be it electronic

circuits, nations, tribes from New Guinea, or Alcoholics Anonymous meetings—Bateson could also transpose sociological assessments of tension and violence to behaviors inherent in groups or to simple topologies and network relationships.

Bateson began by looking at a number of binary patterns in human behavior, whether between individuals or between groups, as in “Republican-Democrat, political Right-Left, sex differentiation, God and the devil, and so on.” He noted that people even attempt to square off in binary oppositions over things that are “not dual in nature—youth versus age, labor versus capital, mind versus matter.” So ingrained are these binary habits for group behavior that they induce myopia in their proponents. Bateson was interested in ternary systems as an alternative to binaries. He suggested that the proponents of binary relationships “lack the organizational devices for handling triangular systems; the inception of a ‘third party’ is always regarded, for example, as a threat to our political organization.” He was especially interested in how and why such binaries generate divisive situations.¹⁹ Three models of binary relationships receive the most attention in Bateson’s writings: symmetrical, complimentary, and reciprocal.

In symmetrical relationships both sides of the binary compete for same dominant position. They mirror each other, and their mimicry may escalate toward “extreme rivalry and ultimately to hostility and the breakdown of the whole system.”²⁰ Imagine identical twins competing for parental affection. Some of these binaries he characterized as complementary motifs: “dominance-submission, succoring-dependence, and exhibitionism-spectatorship.”²¹

In complementary behavior, one party provides an ingredient necessary for the other. Think of the beta dog consistently submitting to the alpha dog to maintain the stability of the pack hierarchy. While submission might be reinforcing and stabilizing in some instances, it can also lead to hostility if “submissiveness promotes further assertiveness which in turn will promote further submissiveness.”²²

In reciprocal relationships, individuals or groups oscillate between symmetrical and complementary relationships. There is an understanding that dominance might be shared, or that one group might be submissive in some encounters and dominant in others. Reciprocal relationships distribute power over time and allow for the trading of roles in a way that stabilizes the relationship. Imagine a group of poker players who take turns letting each other win so that no one member is wiped out and the entire group can continue playing.²³

It may seem far-fetched to assign temperament to infrastructure spaces, but concentrations of power, tension, competition, and submission are immanent in their arrangements. Applied to urban space, it is easy to see the latent violence in binaries of competition and submission such as East and West Jerusalem, San Diego and Tijuana, North and South Sudan, or the mirroring shores of Spain and North Africa.

Bateson also treats violence, tension, competition, and submission in terms of information flow. In competitive or destructive states, the flow of information collapses, whereas in balanced reciprocal organizations, information is more easily exchanged. Bateson considers the stabilizing effects of breaking binaries and increasing the possibility of exchange. His thinking highlights network arrangements that concentrate authority or constrict information, spatial relations that escalate violent situations, as well as organizations that are plural and robustly networked. Restrictions of information, like the closed loop of the zone or the monopolies in electrical or telecommunication networks, are—like the surface ripples on the river—markers of more complex and potentially dangerous dispositions.

Stories are Active Forms

Stories that a culture tells about infrastructure space can script the use of that space; yet in the case of highways, ARPAnet, electrical utilities, Facebook, or the zone, the organizations slipped away from the stories that were attached to them. The misalignment between the activity of an organization and its stated intent is often the first signal of an undeclared disposition. Yet beyond the declaration of intent, some social stories play an additional, powerful role in the ongoing process of shaping disposition.

The sociologist, anthropologist, and theorist Bruno Latour has long recognized that networks like infrastructure space are *active* and that they are composed of social and technical actors. Humans shape infrastructure space deciding, for instance, that electricity will be used for power, lighting, and telecommunications as a public utility accessed via sockets and plugs. But for Latour non-human technologies are also actors. Humans create computers, for example, but computers in turn act upon humans. They are shaped to human needs as devices that respond to hands and laps, but they also inspire further human uses and even the very mental structures that conceive of them. That altered way of thinking influences in turn the next iteration of the computer. In other words, technologies are non-human actors or “actants” influencing the desires and practices of the humans who reciprocally shape them. Indeed, beyond the human/non-human binary for Latour nothing is *merely* an object. Everything is “doing something” and cannot be separated from its actions.²⁴

Latour uses this observation to destabilize the habits of his own discipline. He has been critical of those studies of social-technical networks that use evidence merely to confirm existing presumptions about social patterns or habits.²⁵ In response, he offers an analytic framework that he calls actor-network theory (ANT) to renovate and “[redefine] sociology not as the ‘science of the social’, but as the *tracing of associations*.”²⁶ Rather than codifying or taxonomizing the social or cultural story, he describes a dialogue between humans and non-human technologies that is constantly unfolding and impossible to fix.

An active form can be organizational like a multiplier, a remote, a switch, or a governor, but since the social and technical interact with each other, an active form can also be a social story—not a vessel in which to fix meaning but a carrier to channel a flow of meanings. Form, Latour writes, is “simply something which allows something else to be transported from one site to another ... To provide a piece of information is the action of putting something into a form.”²⁷

A story as an active form, however immaterial and non-spatial, can inflect disposition in infrastructure space and can be deployed with spatial intent. For example, the developer William Levitt associated his suburban housing with familial and patriotic narratives that were particularly infectious in the post-war period, and such stories accelerated the spatial effects of the house as multiplier. The house, its repetitive organization, and the story attached to it all constitute information that contributes to disposition. Similarly, cultural stories about the zone as a rational, apolitical instrument of economic liberalism are active forms that, however disconnected from the actual activities of the organization, drive the zone’s popularity and shape its disposition. A new persuasion about the zone mapped back onto existing cities can be designed as a multiplier with both social and technological components—actors and actants that together alter urban space.

Latour, like Ryle, also uses theatrical performance as a model for the ways in which a string of social actions or stories can influence social-technical networks. Noting that it is “not by accident” that words like script and actor are used in social studies, Latour writes, “Play-acting puts us immediately into a thick imbroglio where the question of who is carrying out the action has become

unfathomable.” Actions are “dislocated ... borrowed, distributed, suggested, influenced, dominated, betrayed, translated.”²⁸ Social networks are “a conglomerate of many surprising sets of agencies that have to be slowly disentangled. It is this venerable source of uncertainty that we wish to render vivid again in the odd expression of actor-network.”²⁹

In some of his formulations of ANT, Latour even makes passing reference to the sociologist Erving Goffman. While distancing himself from more conventional sociology, Latour uses Goffman to make palpable the activities that surround social interactions in excess of declared intentions. Goffman used the word “disposition” to refer to all the gestures, postures, facial expressions, and myriad subtexts deployed in an individual’s almost theatrical presentation of self.³⁰ He marveled that while all these signals often overwhelm, or are “discrepant” from, what a person is actually saying, they are rarely “systematically examined.”³¹

Discussions of performance, indeterminacy, and discrepancy in Ryle, Latour, and Goffman are suggestive of special aesthetic practices used to confront the politics of infrastructure space. With an artistic repertoire like that of a performer, the designer of active forms, comfortable with less control, works on an unfolding stream of objects rather than a single shape. For the designer of stories as active forms—social forms that are nevertheless intended to have spatial consequences—discrepancy presents additional opportunities. Just as the powers that be in infrastructure space are usually offering persuasive stories that are decoupled from what their organizations are actually doing, performers are accustomed to the idea that action is a carrier of information that may be discrepant from the stated text. Actors have a script (e.g., “come home son”), but their real work lies in crafting an action, usually with an infinitive expression (to grovel, to reject, to caress).³² The action, not to be confused with movement or choreography, is the real carrier of information, meaning, and change, and it may be entirely disconnected from the text. Comfort with crafting discrepant, indeterminate action allows design to engage both the naturally occurring dislocations of meaning as well as the duplicitous politics of extrastatecraft.

Diagnostics

Neither deterministic nor wholly malleable, technology sets some parameters of individual and social action ... Different technologies make different kinds of human action and interaction easier or harder to perform.—Yochai Benkler³³

Disposition is an extra diagnostic tool for assessing undisclosed capacity or political bearing in infrastructure space. A multitude of active forms can be used to both detect and adjust a disposition. Like powerful bits of code that can hack the infrastructural operating system, these forms may be technological, organizational, or social. Indeterminate in order to be practical, such forms deliver not a plan but an interplay capable of adjusting different situations and managing a disposition over time.

A contemplation of disposition also summons Michel Foucault’s theories about a social and political “apparatus” or “system of relations” that he called a *dispositif*. For Foucault a *dispositif* was “a thoroughly heterogeneous ensemble consisting of discourses, institutions, architectural forms, regulatory decisions, laws, administrative measures, scientific statements, philosophical, moral and philanthropic propositions—in short, the said as much as the unsaid.”³⁴

The designer of disposition in infrastructure space is a performer. Active form supplements the aesthetics of object form while addressing the politics of discrepancy in extrastatecraft. Not limited to prescription, the designer can engage in improvisation—in the pleasures of *knowing how* as well

as *knowing that*.

Finally, a reading of Latour also offers cautions that are further discussed in the chapter titled “Stories.” The stories that humans attach to technologies like infrastructure space can become enshrined or ossified as ingrained expectations. Stories may evolve beyond fluid scripts for shaping a technology into ideologies that dictate the disposition of an organization. However immaterial, these ideological stories have the power to buckle concrete and bend steel, and they can often be difficult to escape.

1 François Jullien, *The Propensity of Things: Toward a History of Efficacy in China* (New York: Zone Books, 1995), 29.

2 Thomas P. Hughes, *Networks of Power: Electrification in Western Society 1880–1930* (Baltimore: Johns Hopkins University Press, 1983), 14, 404–60; David E. Nye, *Electrifying America: Social Meanings of a New Technology* (Cambridge, MA: MIT Press, 1990), 182, 266, 349, 385–9.

3 Yochai Benkler, *The Wealth of Networks: How Social Production Transforms Markets and Freedom* (New Haven: Yale University Press, 2006), 20, 7–16, 19–20, 278–85.

4 Gilles Deleuze, *Foucault*, trans. S. Hand. (Minneapolis: University of Minnesota Press, 1988), 37; Gilles Deleuze and Félix Guattari, “On Several Regimes of Signs,” in *A Thousand Plateaus* (Minneapolis: University of Minnesota Press, 1987), 141, 142.

5 Ludger Jansen, “On Ascribing Dispositions,” in Max Kistler and Bruno Gnassounou, eds. *Dispositions and Casual Powers* (London: Ashgate, 2007), 161.

6 Many contemporary architects use computer software and parametric thinking in the design of object forms. The discipline rarely applies parametric thinking to active forms—to the relationships *between* objects in the time and space of an expanded urban field. While digital software is not necessary to the contemplation of spatial software, Bruno Latour muses about digital software that not only manipulates geometry but also draws into interplay a web of other urban circumstances and consequences. See the interview with Bruno Latour by María J. Prieto and Elise S. Youn, “Debriefing the Collective Experiment,” July 5, 2004, at academia.edu. Carlo Ratti and Joseph Grima’s “Open Source Architecture” is a manifesto that imagines a more diverse role for digital media in architecture and urbanism. Digital media provides a common platform, like a wiki, to collect shared components, direct fabrication, and interface with the city—a city so embedded with digital devices that it has become an “internet of things.” Carlo Ratti, Joseph Grima and additional contributors, “OSArc,” *Domus Magazine*, no. 948 (June 15, 2011); Keller Easterling, “An Internet of Things,” *E-flux*, (Spring 2012), at e-flux.com.

7 Gilbert Ryle, *The Concept of Mind* (Chicago: University of Chicago Press, 1949), 27–33.

8 Ibid., 27–32, 17–33.

9 Ibid., 31.

10 Ibid., 42–4.

11 Ibid., 125.

12 Ibid., 43.

13 Ibid., 89, 116.

14 Ibid., 119–20.

15 Artists and architects have, at various junctures, pursued design as software or an interplay of active components. For artists like Jack Burnham or Les Levine, software was at once a literal tool and a model or metaphor. The architect Cedric Price designed architecture as a performance of components rather than a single object, in projects like Fun House or Generator, among many others. Architect and mathematician Christopher Alexander used set theory to organize the relationships between components of urban and architectural design, arguing for the semi-lattice rather than the hierarchical tree as the underlying structure. Nicholas Negroponte’s Architecture Machine Group attempted to use urban space as a physical test bed for an expanded field of computing. While the occasional desire for determinacy arguably weakened some of these experiments, they have, however anecdotally, nourished the project of active forms. See Jack Burnham, *Beyond Modern Sculpture: The Effects of Science and Technology on the Sculpture of This Century* (New York: G. Braziller, 1968); Cedric Price, *The Square Book* (London: Wiley-Academy, 2003), reprint of Cedric Price, *Works II* (London: Architectural Association, 1984); Christopher Alexander, “The City is not a Tree,” *Architectural Forum* 122, nos. 1 and 2 (April–May 1965), 58–62; and Nicholas Negroponte, *The Architecture Machine* (Cambridge, MA: MIT Press, 1970), 70–93.

16 Gregory Bateson, *Steps to an Ecology of Mind* (Chicago: University of Chicago Press, 2000), 464, 472.

17 Ibid., 381, 462, 315, 272, 21.

18 Gregory Bateson, *Mind and Nature: A Necessary Unity* (New York: Hampton Press, 2000), 101.

19 Bateson, *Steps to an Ecology of Mind*, 95.

20 Ibid., 68.

21 Ibid., 95

22 Ibid., 68.

23 Ibid., 68–9.

24 Latour, *Reassembling the Social*, 52.

25 STS scholars and theorists would include Bruno Latour, Wiebe E. Bijker, Trevor Pinch, Thomas P. Hughes, Thomas J. Misa, and David E. Nye among others.

26 Latour, *Reassembling the Social*, 8n11, 5. Latour criticizes Durkheimian practices and steps away from, for instance, Erving Goffman's or Pierre Bourdieu's work. Goffman and Bourdieu both use the term "disposition" in a way most pertinent to social studies. Bourdieu, who was also transposing his work to an active realm of practice, used the word to describe a repeatedly structured set of cultural activities or *habitus*. Latour perhaps extends this by suggesting that sociology might overcome its own *habitus* to further consider evolving practices. In this he departs from a branch of sociotechnical studies, arguing that it sometimes enshrines social forms as structured patterns and habits or reifies the structures of social "science." These are the very constructs he wishes to renovate by considering both humans and things, actors and non-human actants, in networks. He raises questions, for instance, about Wiebe Bijker's account in *Social Shaping of Technology* (1995), because "the social is kept stable all along and accounts for the shape of technological change."

27 Ibid., 39, 223.

28 Ibid., 46.

29 Ibid., 44.

30 Ibid., 46; Erving Goffman, *The Presentation of Self in Everyday Life* (New York: Anchor Books/Doubleday, 1959), 141–66.

31 Goffman, *The Presentation of Self in Everyday Life*, 254–5.

32 Sharing a sensibility for theater, Ryle, for instance, makes a distinction between active or "performance" verbs and verbs like "know," "possess" and "aspire." One would not say, for example, "he is now engaged in possessing a bicycle." See Ryle, *The Concept of Mind*, 130, 116.

33 Benkler, *The Wealth of Networks*, 16–17. Network theorist Yochai Benkler refers to what STS philosopher Langdon Winner called the "political properties" of technology, or what sociologist Barry Wellman called its "affordances," which describes some of the special capacities of social media and the internet; see also Jane Bennett, *Vibrant Matter: A Political Ecology of Things* (Durham, NC: Duke University Press, 2010).

34 Michel Foucault, "The Confession of the Flesh," a round table interview from 1977, in Foucault, *Power/Knowledge: Selected Interviews and Other Writings*, ed. Colin Gordon (New York: Vintage Books, 1980), 194.