

Electric Fences, Human Sheep.

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The electrical network is quite unlike the network model of the internet or say telephone networks. The power grid includes no provision for communication across its end points. At the scale of the grid at least, there appears to be no doubt that this is a one-way 'transmission': from the power-station to the distribution network, from high to low-voltage, from producers to distributors to consumers. This is the waterworks or gas-works model; centralized structures of *material* transmission that are widely considered to be precursors to the electrical distribution system. ¹

At the consumer ends of this network lie small, "private" zones where elements of electrical choice may be exercised. As a resident or leaser of a property, as the owner of a factory or shop, as an architectural designer or electrician authorised to create the electrical layout for a space, you are allowed to choose from millions of electric devices, select where they may be placed, and thereby map the visual or control flows of a daily electric life. An "interior design" of the electrical system can thus proceed quite unmolested, to pragmatic or poetic ends, as long as it is limited to the extent of one's ownership. The musical doorbell, the better-than-the-anand's stairway light, the perimeter lighting, the sign for a shop... are all limit cases, marking a threshold of possible public influence. In this scenario collaborative or de-centralizing actions (such as sharing electricity with your neighbour) are naturally discouraged. "Interactivity" is here a domain-restricted, territorially-bound concept, a means of offering difference without conflict.

The behaviour expected from consumers within the electrical network is in many ways reflected in contemporary consumer technologies, despite the latter's louder claims of user participation, customizability, and equity. (Web 2.0-speak appears especially shallow when applied to actual objects and environments- and in notions such as "the semantic city"- given vast, contested histories of ownership and use.)

Technical descriptions and terminologies of the new "everyware" betray other, non-technical instincts. An "embedded system" for example, is a term used to describe a specialized electronic or computer system such as those in cellphones, cars, security systems, and other household and industrial products. An embedded system is by definition "completely encapsulated by the device it controls" (Wikipedia). Its escape from the product is thus impossible. Its operation is inextricable from operations on the surface: buttons, menus, user-interfaces, but also deeper structures of product boundaries, and the protection of those boundaries.

It may appear difficult to apply a metaphor of physical walling to network technologies such as cellphones. Yet, the walls exist, almost literally. For

example, many thousands of programs have been written for cellphones by enthusiasts in the last decade, since many phones run common software platforms such as Java. However, all Java programs on phones run in a "sandbox" that isolates them from all network functions, such as making calls.² In other words, none of these programs can enter the core terrain of the network provider, although they may be able to play with experimental features like games, bluetooth, and so on. This is a classic application development scenario, where the sandbox or other forms of walling are justified in the name of security, and provide a risk-free development environment embedding in existing, widely distributed hardware.

Beyond technical definitions therefore, the term "embedding" speaks of physically distributed platforms that must dig into and exploit conditions of physical ownership and existing conditions of access and use; across objects (products) environments (real estate), bodies (consumers) and nation-states. Proprietary environments provide a physical buffer, and accountability, for protected softwares and systems enclosed within. This is not new. Technologies were, and continue to be, preferentially embedded into spaces that are protected by non-technical means. If anything, scales have changed... we are now looking at minutely striated, distributed forms of "media enclosure".

Yet, despite such "doubling" of the protection regime, leakage occurs constantly. As when hardware is repurposed, phones are tapped, electricity is stolen, or nuclear secrets revealed. "Phreaking", recently dubbed the phone equivalent of computer hacking, has been traced to the late 1950's, before most computers, and is itself part of a long tradition of the creative repurposing and redistribution of technologies. Clearly, such practices cannot be enclosed by current terminologies, or even technologies. The electrical system, in many cities about a hundred years old, is still not free from leakage, micro-distributions and grey zones. This raises the question of whether it ever will be, and if its regulation in the current form is still useful.

Expertise, and the Ongoing Experiment.

The electrical grid is insulated from public participation in at least two ways. Firstly, by the technical fact that electrical transmission, even at its lowest end, carries voltages that can kill. "High-tension" infrastructure such as the neighbourhood substation, its fences and signs, directly evoke physical danger. The message is clear: hands off. With deregulation, private companies have inherited what used to be a regime of state-controlled signs. They also acquired their aura of specialist territory, in a vein that extends to other modern infrastructures: military research, nuclear science, biotechnology, and large construction sites.

The second factor subsumes the first, into a broader social construction of "expertise". Carolyn Marvin, for example, has documented ways in which

engineers and electricians in late 19th century America and Europe attempted to form elite, technically literate and closed groups around the development of this “new media”. This, she argues, led to a form of class-distinction between “experts” and the general public, exacerbating older (and subsequent) hierarchies based on economic class, race and gender. The experts’ strategy was to align with other powerful groups, and distinguish themselves from “mechanics and tinkerers, their predecessors, and from an enthusiastic but electrically unlettered public by elevating the theoretical over the practical, the textual over the manual, and science over craft.”³

This description continues to have resonance, in the decades since. A consumerist notion of technical agency (described above) and a premium on “expertise” continue to mark a very narrow field in which participation in technology can take place. Arguably, this narrows the conceptual understanding of what technology is, and what we can do with it.

My own work is principally as a “media artist”, creating artworks and events that occur mostly in public outdoor spaces, and occasionally in galleries. In these events I have used a variety of technologies, from none at all to some “cutting edge” ones. One of the strands of my current practice deals explicitly with works in the electrical medium. This is an ongoing series, in which I attempt, with the help of others, to address some of the questions above; while building upon a shared history and experience of this deeply “embedded” technology. These are “public works” in which electricity appears newly “uncanny”. Not magical, perhaps (in the way electricity is often described in the arts, medicine and popular discourse of the nineteenth and early twentieth century) but deeply defamiliarizing, and proposing a radical redistribution of electrical “power”.

These works also suggest that the question of electrical “literacy”, a hundred years on, deserves to be asked again. Are we more “lettered” now, after decades of use, or are we merely naturalized? Would we be able to “read” a transgressive, or poetic electrical act? What would it say to us? Could we build it ourselves? Will it need “translation” via another medium? Has electricity become such an uncontested domain that it is no longer worthwhile to be an “expert” in it?

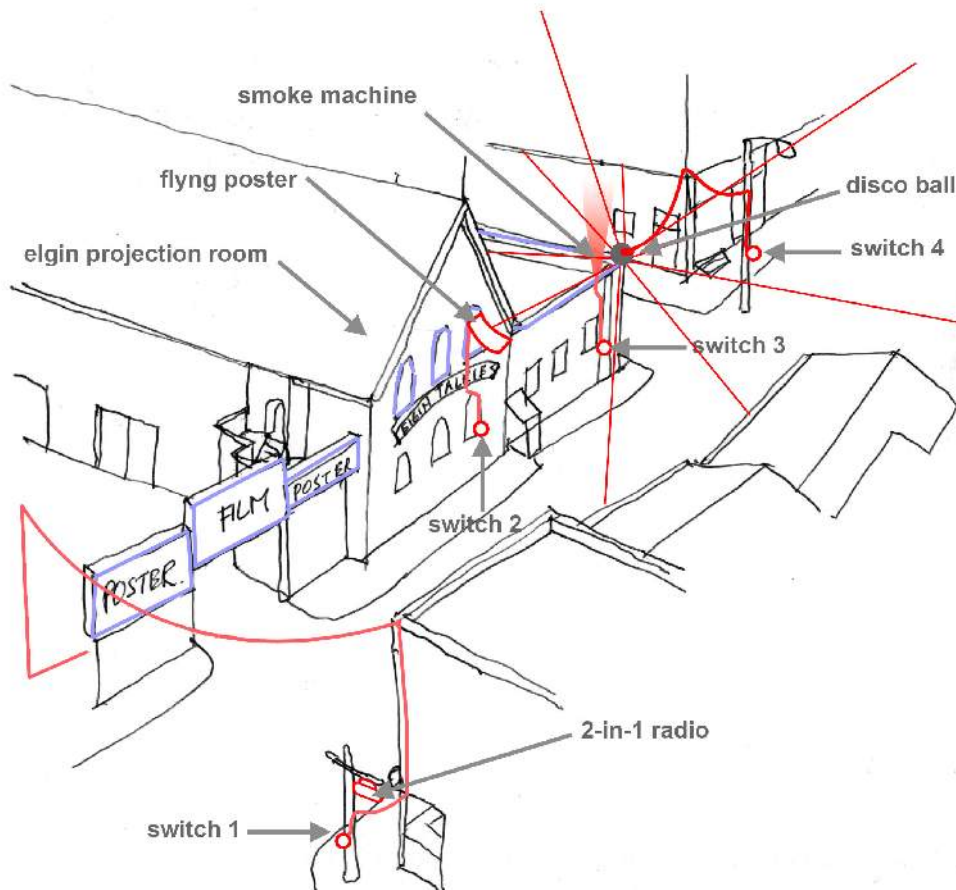
The electrical system in these works is figured as “pre-instrumental”; these are arrangements that do not conform to any known usefulness. They are not, in other words, offering any design, informatics, or architectural solutions. They confront material boundaries, and those of the imagination, but do not offer any resolution. They are, to use a term currently fashionable in architecture, “diagramming”, offering templates for potential discovery, patterns of defamiliarization, and models of misconduct. Almost anyone can “conduct” them, or develop them further. They are an attempt to form an alternative language for something familiar; one whose words we know, but whose story may yet change.

Pictures from one such project are scattered through this text, and a brief description follows below:

Changes of State.

Elgin Talkies is a 110-year-old theater in Shivaji Nagar, Bangalore. As part of World Information City (<http://world-information.org>), the artwork "Changes of State" was set up for a period of five days, in and around Elgin Talkies.

Several two-way mains-current circuits were set up, connecting the building to the street outside. The circuits were "two-way" in the sense that each contained two possible states, which the general public could switch, from the street.



The default state was that of a decorated building. This is also what we had official permission to do. At the same time multiple switches (sometimes three, at other times four) were placed on the building facade and across the street, tied onto lamp-posts. For a total of four final switches, two non-legal street crossings were made (crossing a street with mains current is disallowed by the Electrical

Act), and one electrical connection was drawn from the corner meat shop. These switches caused 'changes' or transformations in the movie house façade, as follows:

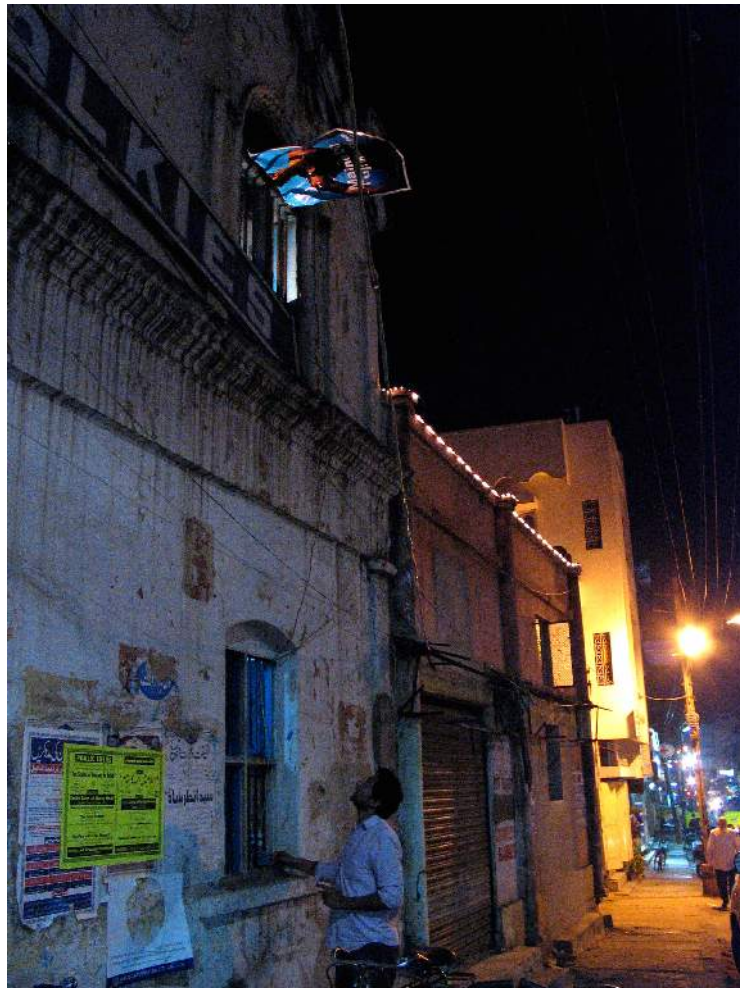
1. From across the street: poster lights go off, music from tape-player comes on overhead.
2. From under the projection room: Archway lighting goes off, film poster is backlit, and flies out.
3. From under the "chimney": Smoke machine plays.
4. From across the other street: Corner lighting goes off, disco ball plays.



All these arrangements were built on-site, or sourced from the local decorator, Hamid Bhai, whose shop was about 50 metres from the Elgin gate. Switches were the on-if-pressed (momentary) type, so the system would return to the default state, if the user released the switch. The "on" state was non-legal, causing electricity to "leak" out beyond the Elgin property line, via the switches, to power the events described above. Each such act was physically transgressive, either extending the envelope of the building onto the street, or stealing the cinema's "media", extending its aura of light and sound. The "criminal" body of the actant completed the circuit, insulated from direct electrical effects by a thin sheet of plastic (the switch itself) and from outright criminality by a buffer of adjacent "grey" practices. Ultimately, the non-legality of the street-

crossing was rendered trivial, by the ubiquity of events such as street decorations that routinely stretch this law, and by the numerous wireless devices that could technically accomplish the same results.

Still, possibly for maybe the first time in this street's history, the general public could trigger an electrical event from across the street. The show of "rewiring", its stretching of property boundaries and appropriation of municipal lamp-posts, caused both surprise and anxiety in the neighbourhood. This was part of the intention: to place simple, "digital" binaries of on and off, and the familiar acts of pressing buttons, into a situation where broader urban factors (or those of human density) come into play - including communal doubt and fear. These are emotions not often found in indoor, domesticated electric life. The "exploding" movie house provided an experience of an "electric city" that in some sense has always bubbled under the surface, with its potentials for displacement, control-at-a-distance, unexpected pleasure, and its inverse, an electrical "uncanny".⁴ In many ways, this was an extension of Elgin Talkies itself, which had offered related experiences (spanning both theater and movies) for over a hundred years, at this location.



Initially, as we were setting up the wiring and switches, the assumption in the neighbourhood was that this was some kind of official celebration of Elgin as a heritage site, or that it was related to a film release. There were no signs or explanations put up, and slowly the lack of clear references undermined the popular theory. These were familiar pieces (the switches, the songs, the hero on the poster, the fog from the machine) in a strange party. It was very unclear in whose benefit, which after a while became liberating for some, and uncomfortable for others. The "expert" was missing, or atleast, his erasure was attempted. The technologies were transparent, the paths from the switches to the apparatus, obvious. There was an absence of "representational" claims beyond what was apparent. Eventually, the semi-official electrical "hacks" became the only thing to hang on to, the only "meaningful" material change, and therefore the subject of the work, and of discussion around it.

Many people ignored it, or tried to. For others, the switch presented a threshold they were not willing to cross, on their own. Others were bored after the first time of "doing it", but would nevertheless come back the next day, to check if they were still around. In general, the switches themselves were quickly assimilated into the noise of the street. Occasionally a disco-ball would light up, and people would look around to find the switch-pressing culprit, who would be embarrassed, or aggressive. Locals would point out these anomalies to visitors. Kids would come back with their friends. Drunks were fascinated, and would not leave. On the "opening" day, a gaggle of foreign (mostly white) conference participants offered some distraction for a curious audience. Over the following days, however, this activity became so "ambient" that many people looking for the art missed it completely. The PWD (public works department, which is on the lookout for electrical violations) and the police passed by several times, without noticing.



I am interested in the idea that these potentials exist over a longer term. Switches that just sit on the street, offering "multi-media" choices, in an apparently semi-official format. In time, the subtler dimensions of this push-button activity would emerge... these are switches that really do nothing until touched, yet represent a potential "crime". They are also switches that modulate behaviour, switches that measure interest, and mark presence. Perhaps we would recognise elements of a broader digitisation of public life. Perhaps we would become wary of other "embedded" states to come.

In computer science, the "finite state machine" is a feedback loop that is seen as a building block for automata, or independent logic. This model explores the basic processes through which, using finite information (bits), higher-level machine "intelligence" can be achieved. The finite state machine is called such because it contrasts with the human brain, which has the disadvantage of coming factory-fitted with infinite states, and thus is a fuzzier, more unreliable thing. Electric "changes of state" permeate human activity at many scales, from the switching of a power grid to digital memory flip-flops (one of the basic finite state machines). These simplest of electrical acts are somewhere activated by a human threshold, of desire or need. The state machine is in this sense never truly finite. For even the most complex machine systems, autonomy or isolation from the "messy" human brain, or human society, is an eventually pointless objective... humans aren't leaving. It follows, then, that we do not have to look to Artificial Intelligence or other advanced machine utopias to tell us important stories about our ongoing relationship with machines. Electricity, for example, isn't leaving either.

Porosities, poetics, forms of communication and manipulation are characteristic of, not just anomalies within, the electrical grid. They are present in the trillions of acts of daily switching, and in the phantasm of real-time electrical "wholesale markets". The question that remains interesting is who controls things at which scale, what are the boundaries of influence, and what may move across these boundaries.

Electricity is still "currency". We are constantly developing new uses for it. It is unencoded, "open source", it fills our world. In the spirit of ongoing change, my own experiments attempt to create new, alternative electric grammars, languages that draw from by our exposure to other technologies, and discourses around newer media. This may, in turn, offer techniques for *detournements* of other centralized structures, on the ground: radio, television, movies, maps, internets and urban designs.

The feedback loop, a central engine for technical evolution is thus implemented as a broader social exercise, involving public libraries of parts and processes, exposed to (and exposing) reservoirs of common knowledge.

Notes:

1. For a broader history see David E. Nye, *Electrifying America, Social Meanings of a New Technology, 1880-1940*. MIT Press, 1992.
Or Wolfgang Schivelbusch, *Disenchanted Night: The Industrialization of Light in the Nineteenth Century*. University of California Press, 1995.
 2. The sandbox is changing, newer versions of Java (and other languages like Symbian or Brew) for phones, allow for concepts like “trusted code” and “object signing” to allow access to replace the box. Needless to say, this is not necessarily making development more open. See opencellphone.org for a completely open source phone-in-development.
 3. Carolyn Marvin, *When Old Technologies Were New. Thinking about electric communication in the late Nineteenth Century*. Oxford University Press, 1990.
 4. Invocations of Freudian “uncanny” are widespread in cinema (noir), architecture (ex. Antony Vidler in *The Architectural Uncanny*) and art (ex. Hal Foster in *Compulsive Beauty* and Mike Kelly in *Playing with Dead Things*). Kelly cites Ernst Jentsch, according to whom the uncanny resides in “doubts” as to whether “an apparently animate being is really alive; or conversely, whether a lifeless object might not in fact be animate.” An electrical uncanny, one could argue, is present at every moment of electrical switching, driven by doubts as to whether electricity “is” life, as in the case of Frankenstein.
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