

The Expressivity of Space

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It is always better to start with the non-human. Else we trap ourselves within the little provincial space defined by the drives and interests of a single species. We owe it to Gilles Deleuze to have equipped us with the tools to break from the idea that all expression is ultimately linguistic, and hence anthropocentric: objective spaces themselves are expressive. For example, before living creatures populated this planet crystals were already expressive. But to whom were they expressing themselves? To no one, they simply expressed their identity through their three dimensional geometry. Biological life appears when from this voluminous expression a one dimensional space, a line or chain of genes, detaches itself. It is true that the proteins that are the expression of this linear genetic space quickly fold into a three dimensional one. Nevertheless we are not brought back to crystalline expressivity because these folded chains have novel capacities: when embedded on a living cell's membrane, for example, they endow the three dimensional space enclosed by it with the capacity to be *excitable*: bacteria can sense spaces structured by gradients of nutrients and swim towards the point of maximum concentration. With the appearance of nerve cells this excitability of spatial forms grows in complexity: social insects can shape their surrounding space, expressing their identity in the process, not only by direct alterations of it but also by soaking it with hormones that excite or inhibit other insects. And when animal behavior ceases to be rigidly coded by genes, as in the case of large territorial animals, spatial expressivity mutates again. Not only certain byproducts of food chains, like urine and feces, become detached from their alimentary function and are transformed into territorial markers, but so are many other parts of an animal's body and behavior: color, sound, posture, silhouette.

Spatial expressivity has another aspect: the relational one. The ecological space inhabited by an animal expresses, through the arrangement of surface layouts, the capacities it has to affect, and be affected by, the animal. To put this differently, solid objects present an animal with opaque surfaces the layout of which supplies it with opportunities and risks: a cluttered space supplies a walking animal with the possibility of locomotion in only some directions, those exhibiting openings or passages, but not in others; the edge of a cliff supplies a walking animal with a risk, the risk of falling, and the sharp edges of the rocks below, the risk of piercing its flesh; a layout of rigid surfaces facing inward, like a hole on the side of a mountain, supplies an animal with a place to hide, either to escape from a predator or, on the contrary, to conceal its presence from its unsuspecting prey. These spatial capacities to affect and be affected are fully objective: the animal may perceive them incorrectly and miss an opportunity or run an unnecessary risk. They are nevertheless relational: the surface of a lake does not supply a large animal with the opportunity to walk but it affords this opportunity to small insects that can move on it because of its surface tension. Perceptual ecologists and behavioral roboticists have a name for these opportunities and risks supplied by surface layouts: *affordances*.

This brief excursion into non-human expressivity already provides us with the vocabulary that we need to examine the work of Rafael Lozano-Hemmer. He deploys populations of objects that are excitable like social insects, changing in the process the affordances of sculptural spaces. But however much this artist desires to become an animal, or at least, a machine simulating an animal, he is despite himself a member of the human species. So he must also deal with social expressivity. Human beings express many things that do not exist in the animal world: spaces like museums and galleries express prestige; the communities that form the art world must sometimes express solidarity; but more importantly, the public spaces created by government organizations must express legitimacy, the legitimacy of their authority. The affordances of public spaces are intimately related to this: in the seventeenth and eighteenth century, as the borders of modern territorial entities were beginning to crystallize, national capitals became the place where their newly centralized governments could express their claims to legitimate authority via carefully designed plazas, tree-lined avenues, streets in which perfectly aligned facades framed sweeping vistas punctuated by a monument or obelisk.

Some of the spaces in which Lozano-Hemmer intervenes are small and intimate. While galleries and private collections must express prestige to other organizations, the art objects within them have their own expressive agenda. Most art objects afford the audience a certain degree of interactivity: we walk around a static sculpture, or look at a painting from different positions, to find the opportunities for visual experience afforded by the right angle. But interactive opportunities can be increased if we endow the art object not only with the capacity to affect the audience but also with the capacity to be affected by it. In the case of insects and bacteria this capacity is derived from the detachment from voluminous space of an expressive line, DNA. Similarly, in Lozano-Hemmer's sculptures, there is a one dimensional expressive space behind the three dimensional hardware: not genes in this case but the long series of ones and zeros that ultimately embody the software animating the hardware. Lozano-Hemmer excitable populations of otherwise unremarkable objects (belts, bottles, chairs) owe their interactivity to this software, as well as to sensors (proximity sensors, surveillance cameras) that mimic those of insects and bacteria. He is fascinated by the ability of excitable populations to display complex collective patterns when each of its members follows relatively simple rules embodied in software. But he also draws humans into the dynamic by making their presence or absence trigger these patterns.

The human body can play a more complex role in these sculptural pieces. Of all three dimensional objects on this planet it is probably the most expressive: facial gestures, bodily movements, stance, posture, gait, behavior, all these supply humans with a vast repertoire of expressivity. But the expressive opportunities afforded by the body may also be transformed. What is more expressive of life than the beating of the human heart? And yet few of us gets to be affected by it unless one's checking the vital signs of the victim of an accident. Through sensors and software this expressive rhythm may be given luminous form, as Lozano-Hemmer does in one of his sculptures, propagating it from the cardiac muscle to the walls of the

exhibition space. Or the capacities of the body may themselves be changed, as when in another sculpture Lozano-Hemmer transforms it into an antenna capable of receiving radio signals.

An interesting space formed by our three dimensional bodies in interaction with light is the shadow. These two-dimensional beings are interesting by the fact that they inhabit a space not defined by rigid lengths, areas, and volumes. Most objects on earth live in a Euclidean space, but shadows inhabit a *projective space*, a space in which metric properties do not remain invariant: our shadows shorten and lengthen with the time of the day or the position of the lights. Lozano-Hemmer uses shadows in all kinds of ways: sometimes they are the part of the body that triggers behaviors in excitable objects; sometimes they reveal other projective entities, like images; and sometimes they escape the original intention of the artist to become an end in themselves, as when shadows of pedestrians carefully projected so that all different sizes remain in focus, unintentionally afforded those casting them a playfulness limited only by their imagination.

This last example already involves larger spaces than the gallery, typically spaces born from the desire to express authority, such as central plazas and monuments. The affordances of these spaces, at least those built in the Grand Manner of the eighteenth century, were carefully designed. The visual opportunities of a city's inhabitants and visitors were manipulated to yield an experience of centralized power and its claims to legitimacy. But Lozano-Hemmer has taken over some of these spaces changing their affordances. The use of light at night in these spaces, for example, is typically decided by government officials and it is therefore part of the expressive agenda of the Grand Manner. But what if powerful lights could be installed all around these public spaces and made responsive to commands not emanating from a central authority? This can be made possible not only by software controlling the lights, making them in effect robotic lights, but also by the decentralized space created by the Internet. In one of his largest installations Lozano-Hemmer coupled these spaces making the affordances of one amplify those of the other: the internet was used to gather commands from around the world, commands determining the pattern that the robotic lights would make, and to give those issuing the commands feedback about the effect they were having in the public space. This way a decentralized human population was given the capacity to affect a space that is not normally under their control, as well as being affected by it as they watch the results of their interventions.

While the intelligent capacities of computer hardware may still be at the bacterial or insect level, software is becoming more and more powerful. One can only wonder how the spatial affordances of small and large spaces will change as a result of this. And one can only hope that artists as committed to animal becomings as Lozano-Hemmer will deploy these new capacities in all their expressivity.



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