
Technology and the Body Public

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Bodies with technique

Arakawa and Gins are concerned with the bio-tech creatures we have become – or perhaps the ones we have always been. They see us as creatures-with-architecture, architecture being for them, and along with language, one of the most basic forms of *technique*. Their ‘architectural body’ is constitutive of its own existence in an ‘architectural surround’ which is itself part of that constitution. The body here is not enclosed within its own outline but is extended in time and space into its surround; it acts and makes itself – it ‘persons’ in their terms – in an active relation to the surround. Perception and action involve more than a subjective interiority, or simply a biological body, they involve the whole bio-tech ‘architectural body.’ Arakawa and Gins contribute to a view that human life is distributed, in the world and self-forming in constitutive and heterogeneous relations which mingle the biological and the technological. There is in this view – and pace Heidegger and Ellul – no essential conflict between technology and the human; here, technique becomes a human and anthropological issue.

This changes the way we understand our place in the world and the problems of life and knowledge. In a world of human technique or the technical human there is no Life as essence, only particular lives in surrounds; there is no knowledge that does not depend on the way things are found in real world situations. Knowledge is acquired in relation to the conditions and problems of life, in relation to which we have to re-objectify the world along different lines. It is this question of the re-objectification and re-subjectification of ‘worlds’ and ‘bodies’ I

will be looking at here. I will do this through a broadly phenomenological lens and in particular through the relation of intentionality on which phenomenology is founded. This relation is that of the subject's relation with the object, or the body with the world (Sartre 1992: 387-391). There are several consequences of this starting position I will expand in this paper, the chief of which is the fact we have to consider the orders of the subject-object relation as finite and constructed in the relationship itself. This opens a way to understanding the ways we are locked, as a consequence of our status as finite, historical and technological creatures, into a structure which is at the same time enabling and constraining. It also raises some questions about the way Arakawa and Gins understand the bio-tech or body-surround relation.

We have moved on from imagining ourselves as Cartesian 'thinking subjects,' free to know ourselves and other things from outside our emplacements and embodiments in a finite and real world. We have become finite 'knowing bodies' knowing and doing what we know and do from within finite surrounds which are themselves extensions of ourselves. It is not the body any longer that knows and acts but the body in its integral relation with its surround. We have necessarily de-naturalised and technologised this 'body' - taken it out of a universe of natural things and forces - and made it subject of and to the technique, and material, of architecture. The world or worlds in which we act are no longer natural worlds, but particular and located answers to questions of how to live and act.

What we recombine in the events of life are not abstract orders or elements of an infinite universe, but elements of finite 'worlds' of our own making. Actions and activities and the objectivities and subjectivities that accompany them are framed in 'worlds' we hold apart from the 'universe.' We go also beyond the times and spaces of the 'thinking subject' and those of the individual body, and become involved in spaces and projects which are human in a more collective and 'public' sense. These spaces and projects incorporate procedures already performed, actions already taken and the coherencies and rationalities of these performances and actions. We must by necessity follow paths already walked,

for reasons already thought, immersed in power-regulating structures or architectures that have long coordinated modes of being and action.

This is not identical with Arakawa and Gins' position and the answer I will try to approach concerning questions of life, technology and knowledge will not join seamlessly with their research. I will emphasise finitude, history and convention, knowing full well the words do not appear in Arakawa and Gins' writings. Nevertheless, to become the beings Arakawa and Gins' address in their research, to become the beings we might become, we will need, I will argue, to pass through the essential historicity, finitude and technique of our own existence. This paper will explore issues of orders that bind and enable in order to fill in what I regard as some necessary background for further work on the body-surround or architectural body.

Bodies in surrounds, or body-surrounds?

A critical question concerns the attachment Arakawa and Gins maintain to the individual body. The body assumes an in-the-moment alertness, autonomy and even athleticism in facing the surround. The surround becomes – and we see this sometimes reflected in their built works – a means to challenge this body. 'Landing sites' are situations of 'pulsing contingency' into which the body inserts itself, linking and juggling the factors of life here and in the moment. For Arakawa and Gins, "Life – Bios – would seem to be constituted by interactions between tentative constructings toward a holding in place, with the body, the body-in-action, surely the main fiddler at the fair" (Gins and Arakawa, 2002: 50). These are events that require our alert response to what is immediate and foregrounded. The times here are of action and reaction; they frame events that are transparent, or that the body aspires to know transparently. Arakawa and Gins tend also, in their focus of the body's awareness of its surround to understand that surround as *resistance* to action, a resistance that needs to be overcome through 'procedures.'

But, I will argue, we lose contact here with factors of the surround and of technique that depend on longer times and a more public body. We lose how much of the surround has to do with *background* and with factors that are present while being systematically bracketed out of attention. We could also end up losing how it is we 'person' – losing how we become not just subject to and constrained in surrounds, but subjects of and *enabled* by those surrounds. From the phenomenological perspective I will adopt, the body is necessarily subject of its surround and enabled by that surround. My exploration will focus more on the other half of the 'architectural body,' the surround, and its spaces and times, in order to expand on this 'subjection.' The question of our determination in an 'iron cage' of a technological space of our own making is answered in several ways: firstly by the idea that this 'cage' is itself an 'optic' on life from within life and a means to awareness that enables actions that could otherwise be inconceivable; that it is multiple, comprising multiple 'technological paradigms' or 'technological spaces' as specific constructions embodying different rationalities or modes of sense, and lastly; by the idea that these 'spaces' comprise possibilities for action we can enter and leave in life-paths that intersect with these other spaces already made.

I will argue that it is through these more public procedures, which is also to say through *techniques*, that we inhabit our surrounds; it is through techniques that we find our selves and inhabit worlds. This self-possession is never something we simply have, but is itself an attainment in space and time. And surrounds are not simply that against or within which the body acts; they are active parts of this attainment of self, encompassing and embodying what we know and do and what we could possibly know and do within those surrounds. The possession of a body or a 'world' by a body stands on no absolute or pre-existing ground; nor is there any pre-existing space or time as a foundation for possession. Possession – which is also to say existence or being – involves the *establishment* of spaces and times in activities of possession, and one of the ways of opening this question is to ask: what are these spaces and times we are talking of?

An attempt to live wholly in the time and space of now and here could end up looking like a tragic attempt to reclaim the infinite. The issue of embodiment and of being part of a world is one of being creatures of time and space. But these spaces and times are neither absolute nor transparent. If the body is subject of its surround and 'persons' in relation to that surround, the surround is 'world' for that body: it is that in which both we and what we know and do are embodied. These 'worlds' are also constructions, put together technically and historically precisely to facilitate this knowing and doing. They are public and technical 'worlds' of enablement that incorporate times and spaces beyond those of the individual body. But that seeing and making sense also elides or brackets out crucial aspects of the surround.

Finitude and sense in surrounds

Whatever is happening in the mind or brain is not an issue because it is not the body on its own that knows and does. But there is nowhere in a timeless or instantaneous event for sense to be located but in the body. We re-establish by default an interiority the shift to embodiment was supposed to leave behind. There are only lives in surrounds and what we need to understand better are the times and spaces of these lives and their surrounds. We need in fact to shift the emphasis away from the 'body' as 'main fiddler,' to restore the body's essential link with 'world' and look for answers in that link. If instead of approaching the problem of embodiment through the attention of the body alert to the events of the moment in its surround, we did that through what the body forgets about its surround, as it forgets its body in action, we may find back some necessary conditions of our embodiment, no longer in the body in a surround, but in that surround as it constitutes and enables the active body.

The question of space is important here: Arakawa and Gins' spaces are still filled with things (Gins and Arakawa 2002: 39), or they are skins moulded to and protective of the body (Gins and Arakawa 2002: xv). They are spaces within which the body "disports" in "cognising stances" (Gins and Arakawa 2002: xxi).

Arakawa and Gins emphasise a bodily subject active in surrounds, and in space. What we need, I propose, is to define surrounds as active *with* the body and body-surrounds as spaces in their own right. The surround needs to be a space integral with and prosthetic to the body as it acts. But this will introduce other times, and the possession of body and 'world' we attain in these other times and spaces is a *common* sense of the world that is common because it depends on constructions and constructions on constructions that go back to the beginnings of our embodied being. These other times and spaces may not be perceived in the moment because they are the ground of our perceiving. They are already embedded, as the structures of bodies in surrounds, in the sites we happen to land in by virtue of birth, life path and happenstance. We are creatures who go through our lives forgetful of most of what Michel Foucault called the "awesome materiality" of our human-technical worlds (Foucault 1986: 149). But this forgetfulness is not an inattentiveness we must discipline ourselves out of; it is a condition of the finitude and situatedness of our being, knowledge and action.

It is not the universe or its space with which we comply in our everyday activity and attention (Gins and Arakawa 2002: xiii); it is precisely this universe we bracket out to know and to act. When we are most alert and focussed, that which gets bracketed out of attention increases rather than decreases, and we act by virtue of our finitude and situation rather than despite it. The 'world' in which we act is a world drawn in and remade for action. It is remade in an active relation between subject and object that is also an ongoing *work* of technique and material organisation. There is a basic *publicness* about this which is not about our being subject to absolute or even human values if we see this 'human' as some sort of disembodied essence (the ideal of 'Man' for example), but rather about the situated, historical and contingent condition of being and acting between others, and between the things and their significances we construct and share with others.[1]

The freedom of movement and of action we experience is conditioned in 'worlds' that necessarily take us beyond absolutes and at the same time beyond any purely individual seeing or doing. These constructions both enable and

constrain, determining what we can and cannot do, what we can and cannot see and even what we understand as being conceivable. Arakawa and Gins attempt, like Helen Keller, to awake each day to make the world anew. They attempt to escape history but what we cannot escape is the fact we do this *enviored* in history, where, like it or not, possibilities for escape may emerge only from within historical sedimentations of technique. The chief irony is that for the finite beings we are, the supporting threads of the very enablement we want to enhance are tied into locations and situations historically formed. We deal with an intelligence that distributes in the surround itself, one that already integrates body and surround in activity. And structures formed in these layers are the surface on which any further procedural 'texts' must be written.

Being clear about the techniques which have formed these structures, we will come closer to being able to see the procedures for changing or enhancing these or creating new ones. These structures will pose the challenges and be the necessary starting point for any further procedures for changing surrounds and enhancing enablement. The question returns to the surround and its relations to the body. The 'interiorities' and the spaces and times of this body-surround relation will be those we need to consider as we frame and bracket things for attention and for life.

Framing human-technical life publicly

It is necessarily difficult to see clearly the conditions of our own seeing. Such conditions are central to any understanding of how we find our places in the world. The 'architectural body' will already be constituted as these public and objective constructions; it will by necessity incorporate shapes of 'worlds' not natural but also not of its own making. It will have to negotiate power with these other structures amongst which we are thrown. The basic form of my argument is that we exist corporeally in co-evolving states of knowledge and states of affairs, within perceptual and empirical horizons that integrate these dimensions in life and in place. The world discloses itself to us within 'horizons' that are conditional on our situation and condition what we may know and do from such

a situation. There are different versions of this argument, including one due to Kuhn who sees 'paradigms' as organising and bounding 'bodies of belief' in which the scopes of practical action and legitimacy in science are established (Kuhn 1962: 16-17). Another due to Foucault sees 'discourse' setting the limits on what may be legitimately thought and discussed and what makes sense (Foucault 1986).

Then, as finite restless beings, things don't simply come to make sense to us between these horizons; we organise, manipulate and construct things to make sense, and adjust the horizons between which things make sense. We may understand these as constructive processes with conceptual and empirical matters being brought together and shaped in practice and discourse. We – and here is where ideas begin to merge with material – manipulate and construct not just the conceptual but also the empirical matters. We shape our surroundings, actively *objectifying* states of knowledge/affairs as arrays and structures of material, organisational and institutional matters which make sense together. As subjects, we move at this point beyond singular 'points of view' and into collective or normative positions organised around language and the material-technical frames (or 'architectures') in which knowledges and discourses are embedded. These discourses and 'architectures' may be multiple but this is a different multiplicity to that which sees there being different points of view on the world from different subject positions. Here, there are different technically supported and realised situations or settings, within which 'views' on the world (or on different worlds!) are organised. These settings are available as 'views' to anyone who has access to and the skills to use them.

The idea of technologies framing human matters can be a difficult one. Technology has been thought of as radically opposed to the human and associated with what the Marxists and others called 'alienation.' [2] There are however other diametrically different ways of understanding technology and its relation with the human: in the philosophy of technology for example, 'instrumental realists' like Patrick Heelan have long acknowledged the central role of technologies in creating the horizons in which the practices of science are

played out.[3] In this view we don't just use technologies to access surrounds already known or directly perceived – we rather see the world through technologies (and see different worlds through different technologies). We become involved and envired in the technologies themselves!

In order to expand on the nature of this technology I will first review an argument from the philosophy of science to demonstrate how both subject and equipment are essential parts of a technological 'construction of reality.' What will turn out to be crucial is the way intention or meaning is 'shifted' into material stuff understood as 'equipment.' This involves an historical and proactive relationship between subject and object and also implies 'space' – the subject and the objects that subject is involved with are related through 'spaces' which are human *and* technological constructions. These 'spaces' are *synthetic* and support what we could, following Karin Knorr Cetina, call 'synthetic situations' (Knorr Cetina 2009: 61-86). I will then take scientific experimentation as a specialised account of human practice to show eventually how 'spaces' we could see as forming more everyday settings or surrounds are structured around different practices and their rationales or senses.

Framing observation

The question of 'horizons' has been central in thinking about scientific experimentation and measurement in a hermeneutical philosophy of science. In this view science is a practical and worldly affair that includes the apparatus and instruments that measure as well as the observer that knows and measures. The approach tries to bracket out none of the conditions of experiment, which include not just the objects revealed in the experiment but also the activities and material conditions of seeing and doing the experiment. The scientific observer and his or her instruments and equipment become necessarily parts of the machinery of knowledge, needed to complete circuits of knowing and being known. Beyond the Cartesian 'thinking subject' knowing and doing are mediated in technical situations. However the bracketing out of certain aspects of the machinery is also part of this machinery of knowledge, so that the knower sees within technically

maintained horizons that enable him or her to see, and then brackets out the technics that maintain those horizons.

Patrick Heelan has argued that experimental science as it is practised is essentially hermeneutical, incorporating, as he puts it, a “hermeneutical shift”, or the displacement of the “cut” between the subject and the object as part of its practical method (Heelan 1977: 11). He adopts what Don Ihde has called an ‘expanded’ or ‘material’ hermeneutics which operates at this crossing of subjective and objective, or theoretical and empirical realms. It refuses strong distinctions between human and natural sciences, founding all knowledge in a human ontology in which knowledge is a product of manipulation and interpretation. The practice of science needs to be understood first, according to Heelan, from a point of view given in the subject’s lifeworld and in relation to the active intervention of the subject in the activity of experimentation.[4] This subject brings to the table sets of intentions and expectations and the skills and ability to manipulate material stuff in ways which shift intentional structures into it (Heelan, 1977:25).

The equipment is manipulated in ways that extend the intention, perception and practice of the subject outwards beyond what is conventionally understood as the limit of the subject. The setting becomes thus both physical *and* theoretical – “non-objective” in Heelan’s terms – as the equipment necessary to prepare the object for observation comes to embody the intentions and expectations of the subject. The human subject also becomes technically maintained in a specific relation with the scientific object. The setting is an *artifice*: nature and its ‘laws’ are not present in the setup, instead ‘purpose’ is transferred to the equipment as the observer-scientist manipulates and adjusts the appearance of phenomena through adjustments to the equipment. What science produces here is practically, hermeneutically, and crucially *technologically* constructed (Ihde 1998: 170-183).

In this model, scientific (or more generally, regularised) knowledge and action involves firstly preparing a setting for action or practice. This setting sets the horizon of what is possible and expected, and it is within this horizon that

regularised and repeatable observations and actions – consistent within horizons of the setting and of expectation – can be made. Seeing is not achieved by passively receiving an impression; it is something actively prepared and it involves physical and intentional conditions which frame outcomes and the way these may vary under the control of the equipment or setting. A relation between language, observation and objects is negotiated in the experiment so that there is in the end no hard distinction to be made between observational and theoretical entities. “[T]heory says what observation can see” (Heelan 1977: 30) and abstractions, including models and theories, are for making those states of affairs that science speaks about observable. Heelan saw that experimental physics is not trying to attain a theoretical model of the world so much as construct practical models for the purposes of observation and measurement!

Science is therefore not an accumulation of and systematisation of factual information about the world, but involves the construction of settings or frames that link and articulate subject and object sides of the problem along with appropriate practices. These settings or frames embody practical rationales – operationalised in models and equipment – that form and transform our view of the world, constructing new realities in the process. This is not about models substituting for reality, but about reality *interpreted* through the use of models. We are no longer looking at theory as an abstract disembodied component of science, but as a materialised cycle involving an intentional subject-equipment complex and a scientific object that is disclosed or produced in that complex. Observation itself comes to depend on the apparatus and instrumentation in which a particular theoretical ‘optic’ is maintained. The setting is a machine for objectification as things come to be the way we see them in the equipment or setting.

Science is ‘dialectical’ according to Heelan, since any anomaly that persistently frustrates the intentional act of observation calls for adjustment or renewal of the theoretical frame (and its embodiment in equipment). So that, consistent with Kuhn, the continuity in the relation between successive theories or models is not necessarily to be found in the comparable syntaxes of successive models, but in

their empirical horizons. An expanded hermeneutics therefore involves us in successive theoretical and material displacements as new or more refined spheres of theory and meaning are embodied in new or more refined material arrangements and apparatus. While the meaning-field of the lifeworld is refined and transformed by theorising – whose practical nature needs to be understood in terms of an expanded hermeneutics – it is also transformed through the ways new technological praxes (including instrumentation) embody new theories (Heelan 1998: 176-177).

Frames and bounds

Horizons or bounds are constructed to frame particular subjects, objects and practices within controlled settings. Nancy Cartwright has highlighted the way equipment and setting shield experiments from unwanted and contaminating influence (Cartwright 1999). This ‘shielding’ plays a more than prophylactic role however; it also distributes objects and ‘optics’ and even steers the processes of experimentation towards expected ends. I have begun here with the highly specialised setting of the experiment itself, equipped for the specialised knowledge and observation of objects like magnetic fields, chemical clocks, or light waves. But other equipment is also involved: even the door shielding the laboratory from the rest of the institute plays a more than negative or neutral role. While it shields the experiment from interference and noise that may contaminate data or distract the experimenter, it also creates a bound positively involved with the maintenance of meaning.

Horizoning and shielding are respectively the setting up of bounds to particular orders and the setting up of procedures against disorder. A door shuts off the lab as a setting for experiment; the institute locates and legitimises the lab, the university supports, legitimises and emplaces the institute and so on. A nested structure appears as factors like academic legitimacy and public meaning and significance of the results of the experiment are accounted for. The framing of the experiment involves in other words systematic and layered sets of ‘theoretical’ and intentional frames materialised in practical, institutional and normative

settings. The objects and objectivities the experiment reveals, depend on the finely-adjusted conditions this construction maintains and is constructed to maintain. Heelan speaks of an 'horizontal realism' as meanings are embodied as intentional structures in 'non-objective' public and institutional hardware and practices. Practical settings are in other words simultaneously empirical and meaning horizons embodied in equipment in such a way they positively *realise* the subjects and objects they interiorise. These structures are *synthetic* and it is precisely the bracketing of nature and the universe *out* of the action that guarantees the appearance of objects as legitimate or real.

I am extending the idea of non-objective equipment outwards in nested bounded domains. We could understand this nesting in different ways: one way would be through a nested structure of scientific authority in which the experimenter is part of a scientific community formalised in faculties, national and international associations with conferences and journals, and all within a larger scientific division of labour of authorised and accredited domains, disciplines and subdisciplines; another would start from the physical apparatus, and go on to the laboratory in which the experiment is carried out, to the institutional building in which the laboratory is housed, to the campus, to the neighbourhood or district, to the city and so on. These two modes are not disconnected; they come together in life, and in practical and theoretical *organisation*, within which issues of practicality and legitimacy are negotiated as public and normative.

It is also *material* organisation: none of this is simply abstract or belief; all this is built into hardware, organisational structures and practices. All of it includes embodiment in buildings and infrastructures, staff, protocols, schedules, practices, bureaucracies and budgets. Organisational structures and bounds are embodied in material-organisational *constructions*, where they are developed, maintained and adjusted by communities that are themselves nested. They structure relationships between different elements *within* constructions as well as relationships *between* constructions, so that the bounded constructions of experiment, lab and institute also have regularised relations with each other.

We begin in a sense, with this idea of ‘construction,’ to materialise and spatialise the notions of ‘paradigm’ and ‘discourse.’ A paradigm is, according to Kuhn, a “body of intertwined theoretical and methodological belief” (Kuhn 1962: 16-17). A ‘discourse’ is the bodies of “rules concerned with the principles of classification, ordering and distribution” (Foucault 1986: 152). Empirical horizons are themselves embodied in ‘equipment’ which also embodies ‘theory’ at every level of the construction. The notion of expanded or material hermeneutics allows us to conflate the horizons of ‘bodies of belief’ and ‘bodies of rules’ with empirical horizons. Both paradigms and discourses are embodied and produced in specific locations. What we end up with are shielded settings which are themselves centred and decentred, located in and extended by, ‘networks’ or ‘spheres’[5] *interior* to which sensible or authorised – in any event consistent – logics or rationalities linking subjects and objects operate, along with sensible or approved modes of action.

We don’t just expand hermeneutics therefore; we also extend hermeneutics into multiple ‘networks,’ ‘spheres’ or ‘spaces’ inside which particular expanded hermeneutics operate. None of this is watertight of course, all of it requires a continual work of maintenance to sustain, all of it is about the structures, orders and rationalities that are the necessary condition of knowledge and action and that we take the most for granted and maintain most unthinkingly. It concerns, as Foucault has put it, the “ponderous, awesome materiality” of the “production of discourse” (Foucault, 1986:149). We know the theoretical horizons; we have the knowledge to deal with this world we find ourselves part of; what’s often not clear, and this seems counterintuitive given its ‘awesome materiality,’ are the empirical horizons. But by now it should be quite clear why these horizons don’t reveal themselves easily to us as conditions of knowledge: the embedding of discourse as authorised or veridical knowledge in the world is precisely what we bracket out as part of our procedures of knowledge. ‘Theory’ is what is left over once we have discounted the historical and situational fact we have created the conditions for the having of that knowledge. ‘Theory’ is what is left over when we discount the real world techniques and technologies of that knowledge we and our forebears have built into the world – techniques that hold us into

paradigms and discourse and make such paradigms and discourses legitimate and conceivable, and their alternatives often practically inconceivable.

The spatiality of this is important: beyond the 'thinking subject' there is another way to parse the universe – no longer into the abstract and segregated categories of 'natural,' 'human,' 'technological,' 'economic,' 'social' or whatever, but into 'spaces' as 'spherological' material-organisational realms, each of which operates as a 'world' with its own rationales and principles of organisation. We begin to see the outline of another order in which 'subject' merges with 'object,' 'bio' with 'tech,' 'theory' with 'practice,' in synthetic and prepared organisational 'spaces' and settings that themselves establish the boundings of the orders. What a phenomenology filtered through Heidegger and Heelan gives us in the end is a practical-equipmental and techno-relational inhabitation of the world by way of prepared and maintained spaces and settings for regular practice and the humans committed to the care of these.

This implies a situated, historical and accumulative expansion of *public* lifeworlds – as material cultures – through the hermeneutical shifts of intentional structures into (variably – here we come to questions of power) shared organisational and territorial equipment or technology.

Technological 'paradigms' and 'spaces'

The organisational principle extends into geography: laboratory and university are themselves embedded in our built environment in structures that organise and divide territories, and legitimate places for certain practices and actions and not for others. This is not simply a matter of imposed norms and rules as ways to discipline territories and their use but also a more subtle discipline of things being 'in place' and making sense in relation to other things. The chief techniques behind these practicalities and normalities are of course language and 'architecture' – though the 'architectures' I will refer to later have a particular web-like or network quality. This is a political geography of communities, places and territories organised in spatial technique.

Spatial techniques and technologies will be, in this way of thinking, more than simply means to movement or communication; they will be more than simply ways to 'compress' a space already given by the geodesic surface of our globe. A conventional view of network space used in geography today, sees the world from the outside and imagines flows of people, things and especially money crisscrossing the surface of the globe seen from a stratospheric perspective (Massey 1994: 146-156). These other spaces I am talking about are radically different to this: they are generated out of the subject-object relation and built out in the world from this perspective. They are built out in the process of producing or constructing settings which are a condition of knowledge and action. These settings and spaces are multiple, comprising 'worlds' in which particular rationalities are interiorised and shielded from the universe, and within which facts, things and ideas, and the practices that accompany them, are produced together and make sense in relation to each other. The overall pattern seen from the stratosphere would, drawing on Cartwright again, be "dappled" (Cartwright 1999). However, in the normal course of events we would never see them in this perspective but rather in life paths that take us in varying forms of subjectivity through the different 'spheres' of our practical lives.

I have likened these structures to 'paradigms' so that 'technological paradigms' would be bounded or horizoned spaces or of objects, subjects and practices. The notion captures the fact that in a contextual world, subjects, objects and practices hang together in organised settings and their meanings are conditional on their being framed together. In such a view the emphasis is on surround as a space in which things and ways of doing things come in whole arrangements which need to be assembled, maintained and practiced in order that meanings come to be and remain stable. It is not only subjectivities that are formed in these arrangements but also objectivities, the *realities* of which depend on the horizons in which they are framed. There is a material basis to the meaning and significance of worldly entities in *being with* other entities, and in order to be durably what they are, they need to be held in place and maintained in these relationships. The process of the shaping of life in technology creates spaces of things and ways of doing things centred around meaningful objective stuff and

technique. These things and ways of doing things depend on each other and make sense together: they co-contextualise each other within the space. The 'technological paradigm' I propose is a whole arrangement of objects, subjects and practices that make sense in drawing their significance from each other.

In fact the idea of 'technological paradigms' has been used before. But Manuel Castells' version of the 'technological paradigm' emphasises a new condition lead by microelectronic communication media and the new social organisational structures they enable (Castells 1989: 12-13). It misses the more everyday structured entanglement of technologies in life. Castells 'paradigm' is a singular condition and misses the massive multiplicity of the 'paradigms' as I have outlined them here. In fact, the technologies themselves are perhaps less significant than the 'technological spaces' they produce and in which the technologies are tactically enrolled.

We move with this idea beyond considerations of technology as something to be simply used or read by a subject and as exterior to human life. We move beyond it being a contemporary force for a generalised alienation. We move instead to consider technologies as implicated in 'spheres' of life through multiple particular spaces of perception, conception and practice in which objects and subjects are revealed (Read 2008: 7-22). A description by Roland Barthes of 17th Century Amsterdam serves as an example: he spoke of the "itemizing power" of Amsterdam's canals as "objects interrupt each horizon, glide along the water and along the walls. It is objects which articulate space. The object is by and large constituted by this mobility, Hence the defining power of all these Dutch canals. What we have clearly is a water-merchandise complex ... making the entire city into a census of agile goods" (Barthes 1972: 6-7).

The 'water-merchandise complex' Barthes identified was a technology that formed and centred everyday things and ways of doing things in a bounded and centred space. It was an equipment and a space centring porters and merchants as subjects, the objects of merchandise and the practices of their movement, hoisting and storage. It formed the city to a 'material semiotics,' a structure

simultaneously material and meaningful. 17th Century Amsterdam provides another pertinent example because the network of urban canals and warehouses was complimented by another network – of cities strung together around shipping routes and ports along with the practices, bureaucracies and standards of exchange and trade that made the rationales and business of trade possible between them. And then these two ‘worlds’ were hinged together in the harbour. The harbour was where most of the activity was – at the interface and articulation between the intra-city infrastructure of goods transport and an inter-city system of trade and exchange. We see a clear demonstration of how spaces define practical orders and rationalities but do not prevent us from traversing between spaces. We move into and out of and between ‘worlds’ and in fact it is at the articulations of different ‘worlds’ that valued places appear around which further developments are accumulated.

We can begin to see how technologies, or ‘infrastructures,’ as I will use the word here, are technical networks arranging and distributing places, things and practices that have and draw their significance in relation to one another. Whole arrangements of subjects, objects and practices work together around infrastructures to construct larger normative and political geographical entities – like neighbourhoods or cities or regions or nations. These are arrangements realised in specific historical times and conditions and to the social-organisational and technological state of the art of their times and places. Ships, camel trains, railways, tram, metro and highway systems – but also the streets of neighbourhoods – have all played major roles in establishing the normalised and named spaces through which we understand our political geographies today. Catalogues, room allocations and class schedules, business practices, trading and accounting standards, and communications protocols have played major roles in establishing the spaces of libraries, educational institutions and commerce. They establish practical and of-their-times ways of knowing and doing things between and in the presence of other things.

Other examples could be given: all of them would be contingent and historical constructions, which is not to say that translocal consistency as transfer of

practices and technologies is not a factor (Hård and Misa 2010). But any search for general, abstract or theoretical answers to these questions would be misplaced: we find our way in the world and then normalise, objectivise and subjectivise these ways, not the other way round. Concrete cases are all contingent attempts to mould 'worlds' as simultaneously technological-conceptual fields and fields of practice. Architectures and technological spaces become part of the human *oikoumene* where they embody reasons, produce subjects and objects and establish places for practical activity. This material-organisational production of 'space' is an outcome of the hi-tech of any time, and has been the driving force in establishing human organisations, including a historically accumulated structure of places.

A practical and public order

Human surrounds are finite, 'public' and humanly made and structured as multiple enabling non-objective 'worlds.' Objects are oriented and available to us in these 'worlds' in practical settings and in relation to other objects. In an organised equipmentality *Dasein* (being there or existence) becomes *Mitsein* (being with or coexistence), even when other people are not immediately present. In Hannah Arendt's words we live in a world "between men", but also between the things that are human in more historical times and senses. We construct and adapt these 'worlds,' and have done so as long as we have been building, to have 'things in place.' We are, in Heidegger's terms, 'thrown' into a world already structured and already expectant in material and practical ways of knowing and doing things. The publicness I refer to is a dense web of ties to 'indeterminate others' that references common worlds of equipped situations which are conditions of our acting. We become public between things and others in a realm Michel de Certeau characterises as "the oceanic rumble of the ordinary ... the place from which discourse is produced" (De Certeau 1984: 5).

For most architects and others working in the built environment today, the body is still the container of a reflective interior machinery of cognition. In this conception the body and surround oppose each other, the body being the

producer of discourse which it imposes on the surround. Arakawa and Gins have shifted attention to the body-surround relation; their architectural body is a merging of body with architecture, body and architecture merging to give us a different architectural body. However Arakawa and Gins maintain a polarity between body and surround and suggest that it is in this oppositional relation that human life and well-being may be enhanced. This opposition defines space as a container – for things in space and for body in surround. This opposition informs the hermeneutic or interpretive state of the body in relation to its surround.

Phenomenology also begins from the body-surround or subject-object relation. However, research in this tradition points to the way body and surround are not opposed but merge and act together. Surround has to be understood in terms of the technological spaces that draw body and surround into configurations so that action becomes *directional* breaking out of rather than being contained in surround. The surround stands not in opposition to the body but incorporates intentional structures – it becomes non-objective – in its relation to that body. Body-surround act together in object-subject-practice complexes, and what I have added here is a proposal as to how we can understand these complexes as ‘technological spaces.’ The ‘extended’ hermeneutic is of a being between things in which objects and subjects are formed together and in practice. In place of a hermeneutic of subject reading object, we have subject-object-practice complexes or *spaces* in which subject and object are formed and act together.

What acts and what perceives and knows is not the body in its surround or the body against its surround but rather the body-surround. But this body-surround (or architectural body) is also produced outside of the times and spaces of the here and now. What I have outlined here is an idea of these ‘worlds’ or ‘spaces’ ‘tied up’ in historical structures. These are also however ‘worlds’ we shield and bound against an intrinsically open rather than ‘law-bound’ nature. They are ‘worlds’ we depend on for any sort of stable meaning or coherent action at all. And these constructions are stable and permanent only to the extent we maintain a culture of care in relation to them. These ‘spaces’ are in themselves contingent

and open to tactical manipulation and a progressive practice of human enablement or enhancement. We will however need to engage with the more *public* bodies we are in these structures in order to invent ourselves further (Gins and Arakawa 2002: xxi) There are no absolutes here either and once we understand them better, they offer opportunities at many levels (in many of these multiscalar but real and specific 'spaces') for intervention to the ends Arakawa and Gins propose.

There is however still a question of power that needs to be addressed. These landscapes of 'technological spaces' are already formed. They already network and select particular places in particular networks and leave out others. And they incorporate massive differentials of power in the way they do this. Things are in fact already distributed and places are no longer the 'neutral markers' we sometimes take them for (Gins and Arakawa 2002: 6). Particular practices are already preferred in particular networks and not others: there is an enormous potential advantage in being plugged into a network of global traders for example connected to servers that distribute and redistribute finance at lightning speed, rather than one that draws together the components of an inner-city neighbourhood. This is not a question of materiality or place-boundedness versus immateriality, virtuality or speed; it is about the distribution of different technological spaces, all of them material and highly designed but some of them a great deal more powerful than others, and the ways they connect particular places and not others and facilitate particular practices and not others.

Notes

[1] Heidegger was the author in *Being and Time* not only of the concept of *Dasein* (being there), but also of that of *Mitsein* (being with). The interpretation I follow of this term is not that of Hubert Dreyfus, who argued indeed that *Mitsein* represented some essential idea of Man, but is closer to that of Frederick Olafson (Olafson1994: 52; Read 2008: 10-11)

[2] Heidegger, Jaspers, Ellul and Mumford, all propounded a variant of what can be called a 'thesis of alienation' More recently Albert Borgmann has done the same.

[3] Don Ihde lists Robert Ackermann, Hubert Dreyfus, Peter Galison, Ian Hacking, Patrick Heelan, Ihde himself, and Bruno Latour as instrumental realists (Ihde 1991: xii-xiii).

[4] The notion of *Lebenswelt* or lifeworld was introduced by Edmund Husserl. The lifeworld is identified as "the only real world, the one that is actually given through perception, that is ever experienced and experienceable." He opposes it to the ideal world of Galilean science where there is a "surreptitious substitution of the mathematically substructured world of idealities for the only real world" (Husserl 1970: 48). Heelan argues that the observable scientific entities of experimental science belong to the lifeworld.

[5] One could imagine 'networks' here to be something like the networks Bruno Latour describes as part of actor-networks (Latour 2005). I am imagining 'spheres' to be something like the spheres Peter Sloterdijk describes (Sloterdijk 2009) in order to clarify the 'space' I intend.

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