

## Introduction

# 'Man is the Measure of All Things'

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This introduction takes its title from a quotation of the pre-Socratic philosopher Protagoras, which opens Ernst Neufert's *Bauordnungslehre* in the 1943 edition, a book which, arguably, would become one of the most influential manuals of architecture in the twentieth century.<sup>1</sup> The phrase is positioned above an illustration of a 'standard man', broken down to its dimensional modules, which Neufert would use as the norm through which an entire world of standard living would be constructed. Neufert's standard man was a descendant of a humanist tradition that went back at least to Leonardo da Vinci's Vitruvian man, channeled through the requirements of modern industrial economy.<sup>2</sup> As Neufert would develop his Octametric system, which attempted to standardise masonry with a 12.5 cm module, he amended the dimensions of the standard man accordingly.<sup>3</sup> And so the opening quote appears in an ironic light: the brick was in fact the measure of all things, including man, trapped forever in a three-dimensional Octametric matrix.

Bricks were also involved in what can be considered the most complete experiment in conditioning humans – the advent of scientific management at the turn of the twentieth century. Frank and Lillian Gilbreth, who would become known for their 'time-and-motion studies', initiated their quest towards efficiency by developing a method to optimise the process of bricklaying. As they aligned their practice with the ideas of Frederick Winslow Taylor, they used chronophotography to analyse and engineer bodily movements, a method which they

understood as a malleable process of integration between the worker and his environment. This practice was soon backed by an ideological and moral drive. In their 1912 *Primer of Scientific Management*, the Gilbreths argued that time-and-motion studies could form the basis of a 'science of eliminating wastefulness resulting from using unnecessary, ill-directed, and inefficient motions'.<sup>4</sup> This was in line with contemporary ideas of efficient production, which, Martha Banta writes, saw 'the human element' as the only obstacle to a better society. It was therefore proposed that a closer alliance with the machine should be forged, in which 'the machine was [presented as] the great emancipator of mind and soul'.<sup>5</sup> The Gilbreths thus studied not only the physical qualities of workers, such as anatomy, health, nutrition, size, and mode of living, but also their skill, training, and earning power, and even gave attention to psychological features, such as creed, contentment, and temperament. They then specified the variables of the working environment, which included everything from the size of the units moved and the tools used in the process, to lighting and heating conditions, colours used in the space, and social factors, such as union rules.

The attempt to analyse and get into the mind of the worker was not common among the apostles of scientific management, who were mostly focused on the more technical aspects of work.<sup>6</sup> It was developed in a context of attempts to integrate psychology into economic industrial rationale, significantly promoted in the works of German-American

psychologist Hugo Münsterberg, who inquired, in one of his influential publications: 'how we can produce most completely the influences on human minds which are desired in the interest of business?'<sup>7</sup> In response to this challenge, Münsterberg proposed a complex interaction between humans and machines, in which both needed to adapt: 'No machine', he writes, 'with which a human being is to work can survive in the struggle for technical existence, unless it is to a certain degree adapted to the human nerve and muscle system and to man's possibilities of perception, of attention, of memory, of feeling, and of will.'<sup>8</sup> In his view, what he termed 'psychophysical energy' flowed seamlessly between minds, bodies and machines, blurring the boundaries between 'subjects' and 'objects', now entangled in a continuous process of reciprocal adaptation.<sup>9</sup>

While descriptions of psychophysical energy may strike a note of strangeness in our contemporary understanding of mental processes, they prefigure the feedback environments of cybernetic thinking, in which organisms and machines populate a universe of communication. As Beatriz Colomina and Mark Wigley noted, the schematic representations of these environments echoed Neufert's 'silhouetted normative body surrounded by geometry', now showing 'images of the human inside cybernetic feedback loops'.<sup>10</sup> However, at least in theory, man was no longer the measure of all things: human actions and reactions were deciphered in similar ways as these of other organisms and machines, which opened a glimpse into a non-humanist view of the world.

The problem was that cybernetics was from the outset related to (human) control. Norbert Wiener was well aware of that not only in his initial definition of the new field as 'the science of control and communication in the animal and the machine', but in expressing his hopes that 'the good of a better understanding of man and society which is offered... may anticipate and outweigh the incidental

contribution we are making to the concentration of power.'<sup>11</sup> Behind the dreams and aspirations of the cybernetic project for achieving interactive and contingent devices and environments, lay the contradictory legacies of behaviourism, teleology, and control engineering, as Lucy Suchman well noted.<sup>12</sup> Ultimately, cybernetic thinking led Western societies to subject themselves to a grand experiment that Donna Haraway presciently described as 'the translation of the world into a problem of coding'. It is 'a search for a common language in which all resistance to instrumental control disappears and all heterogeneity can be submitted to disassembly, reassembly, investment, and exchange.'<sup>13</sup>

Three decades after these words were written, the algorithms that were developed by Silicon Valley technocrats promising the creation of yet another better world keep devouring our subjectivities into bits of data, turning in the process the environments we inhabit into surveillance and conditioning machines. Malls and casinos track movement patterns, wearable technologies record heartbeats, social media crawlers monitor reactions, and polling companies aggregate sentiments to transform all human thoughts and actions into monetisable data, with the implicit ambition to condition humans to an invisible matrix of supply. The dream corporations now dream is a complete passive version of ourselves, constantly served with products and experiences with the human element reduced to the confirmation of a credit transaction.

As Michael Osman noted, at some point at the inception of these intertwined histories of management and control, a 'misalignment between regulatory thinking and architectural discourse' materialised.<sup>14</sup> Under the guise of being necessary to fulfill biological needs, mechanical systems, record keeping instruments, furniture, or diagrams formed an infrastructure of control and regulation that dislocated the human from its assumed centrality. These systems of conditioning were

merely accommodated by architectural design practice, and taken as part of a determined path towards rationalisation – disregarding other forces and their motivations towards predictable outcomes and security. This issue of *Footprint* focuses on instances in which architecture plays a more active role in these processes. When companies such as Amazon or Google reimagine homes as responsive information envelopes, when museums and retail spaces rethink their interiors in light of its social media impact, and when wearables and other devices track and determine every movement in a workday in a logistics warehouse, architecture's capacity to mediate between our inner landscapes and our surrounding world is undermined.<sup>15</sup> The issue contains cases in which Man – a constant around which fundamental concepts of architecture were developed for centuries – becomes a malleable category, to be deliberately challenged and altered through spatial and environmental manipulations.

The term Man, and the humanist tradition which followed from it, have been challenged in feminist, queer, poststructuralist, and postcolonial critiques, which questioned its nature, or even pondered if we are actually human.<sup>16</sup> What we seek here is to add to these perspectives cases of what we call *radical conditioning*, in which some architectures bypass assumed values of humanism and operate under a wholly different set of values, emanating from industrial and post-industrial economies and its technological developments. These architectures dictate the creation of spaces in which the human body has to operate, and to which it needs to adapt in order to survive. The research articles and visual essays included in this issue shed light on the many ways architects, advertently or inadvertently, coalesce with forces intending to condition humans. Unfolding in the study of histories, architectural types, aesthetics, atmospheres, systems, and users, authors propose inquiries along two main directions.

The first trajectory highlights the prolific use in spatial design of concepts borrowed from cybernetics and information technology – user participation and feedback loops for example – for the conditioning of human behavior through the built environment. Nina Stener Jørgensen investigates the concept of user participation through digital technologies in 'Capital of Feedback: Cedric Price's Oxford Corner House (1965–66)'. The analysis of this unbuilt project by the celebrated British architect, and his oeuvre in general, serves as a way of casting new light on his concept of participation and user interaction with the help of technology. More importantly, Jørgensen boldly presents Price's work as both a potential guideline in today's use of information technology and smart systems in design, and as a cautionary tale on contemporary promises of emancipation through technology.

With 'Action Office, or, Another Kind of Architecture Without Architects', Philip Denny articulates how Robert Propst, the inventor of the Herman Miller Action Office furniture system, defined the protocols for transforming every component of daily office work into a cybernetic loop full of data that could apply to projects beyond the workplace. Denny argues that, devised as a multimedia system aimed at circulating data through the workplace, Action Office complicated the boundaries between architecture, furniture, and organisation – a fact that has kept the full breadth of Action Office somewhat away from mainstream architectural scholarship.

Andreas Rumpfhuber opens up the Quickborner Team archives with 'In Praise of Cybernetics: Office Landscaping and the (Self-)Conditioning of Workers'. In this visual essay, text and graphic materials dissect the cybernetics-inspired design methodology of this system proposed in the mid-1950s, and the non-hierarchical organisation of the resulting Bürolandschaften (office landscapes). Ultimately, Rumpfhuber argues that the Quickborner Team's goal was not only to radically,

and constantly, reorganise office floors based on feedback loops, but to facilitate the self-conditioning of workers to the benefit of the organisation.

The second trajectory deals with architecture conditioning the creation of new subjectivities, placing the body as the territory of intervention. These contributions elucidate and speculate on the relationship between the design of the extracorporeal and the conditioning and design of the corporeal.<sup>17</sup> In 'Building Bodies, Constructing Selves: The Architecture of the Fitness Gymnasium', Sandra Kaji-O'Grady and Sarah Manderson present a survey of different types of gym, their architectural articulation, material language, and atmospheric qualities. With that, they highlight how these spaces, their fetishisation of traditional spaces of work and control, and the rituals that happen within, (re)produce a desire to voluntarily submit oneself to discipline and assessment towards the construction of new subjectivities and the redesign of the body as an object of conspicuous consumption.

With 'From Exigent to Adaptive: The Humans of Air Architecture and Beyond', Elizabeth Gálvez discusses Yves Klein's attempt to envision a post-mechanical architecture that establishes a new, playful relationship between human bodies and the environment. With the survival of the human species at stake amidst the climate emergency, Gálvez's visual essay radically proposes to reconsider Air Architecture as a model towards creating an architecture nurturing a future adaptive-human species.

In 'A Conditioned Exchange', Fredrick Torisson looks at conditioning in the sense of how a certain environment can enable the development of a certain subjectivity, and offer conditions for it to thrive – something which, in turn, locks in the development of the architectural type along a certain path. In particular, Torisson offers an overview of the transformation of architectural spaces for exchange

in the sixteenth and seventeenth centuries and its relationship to the emergence of an ethos of speculation and the formation of a new subject, the *homo oeconomicus*.

Finally, in her visual essay, Nitzan Zilberman proposes to look at a recent typological invention, the selfie museum, as an environment that challenges architecture's basic ideas of programme and aesthetics. 'On Display: The Strategy of "Flattening" in the Selfie Museum and its Relevance for Architecture' shows how these museums have turned from the display of objects to the display of environments and orchestration of experiences, essentially blurring the line between body and display, and turning subjects into objects to be distributed via social media.

As a whole, these narratives explore the agency of architects and designers to operate in ways that challenge the association of spaces of extreme conditioning with the Hegelian rise of the machine as an inevitable, mythic force external to, but taking over, human culture, to eventually substitute obsolete humans. This prophecy, which shadows the development of machines from automatons to Deep Learning, is heavily biased. First, because it lends ultimate power to those that own and rule the technology – which happen to be those who would benefit from its proliferation. Second, because by doing so it renders humans that work alongside, communicate, and sometimes teach the machines invisible. Mechanisation, as Sigfried Giedion wrote seventy years ago, 'is blind and without direction of itself'; it is more dangerous than any natural force because 'it reacts on the senses and the mind of its creator'.<sup>18</sup> But perhaps a close scrutiny of the spaces in which humans and their artifacts interact in unprecedented ways could provide architecture with the timely opportunity to challenge our anticipated redundancy, and reconsider its own humanism in order to charge it with new meanings.

## Notes

1. Ernst Neufert, *Bauordnungslehre* [Lesson in Building Regulation] (Berlin: Volk und Reich Verlag, 1943).
2. 'It was from the members of the body that [the ancient Greeks] derived the fundamental ideas of the measures which are obviously necessary in all works, as the finger, palm, foot and cubit', Vitruvius famously asserted, yet, at the same time, he conditioned the perfection of these bodily dimensions to their fit within a precise geometrical armature, leaving open the ambiguous question of whether the body is defining the geometry or vice versa. See Robert Tavernor, 'Contemplating Perfection Through Piero's Eyes', in George Dodds and Robert Tavernor, eds., *Body and Building: Essays on the Changing Relation of Body and Architecture* (Cambridge, MA and London: MIT Press, 2002), 78–93; Beatriz Colomina and Mark Wigley, *Are We Human? Notes on an Archeology of Design* (Zurich: Lars Müller Publishers, 2017).
3. Jean-Louis Cohen has discussed Neufert's continuous standardisation efforts, which he managed to promote both under National Socialism and after the war ended. See his *Architecture in Uniform* (Montreal: Canadian Centre for Architecture, 2011).
4. Frank Bunker Gilbreth, *Primer of Scientific Management* (New York: D. Van Nostrand Company, 1912), 8. Once the working body was compared to a motor, some scientists 'reasoned it might even be possible to eliminate the stubborn resistance to perpetual work that distinguished the human body from a machine. If fatigue, the endemic disorder of industrial society, could be analyzed and overcome, the last obstacle to progress would be eliminated.' In Anson Rabinach, *The Human Motor: Energy, Fatigue, and the Origins of Modernity* (New York: Basic Books, 1990), 2.
5. Martha Banta, *Taylored Lives: Narrative Productions in the Age of Taylor, Veblen, and Ford* (Chicago: University of Chicago Press, 1993), 26–27.
6. The interest in the mental aspects of work can be attributed to Lillian Gilbreth, who not only wrote *Primer of Scientific Management* (as well as most of the published works by the Gilbreths), but also earned a PhD in psychology and published her dissertation, *The Psychology of Management*, in 1914. Lillian Gilbreth's attempt to apply psychology to the workplace stemmed from her interest in educational psychology, which she studied briefly with A. H. Thorndike, one of the forefathers of educational psychology, at Teachers College, Columbia University.
7. Hugo Münsterberg, *Psychology and Industrial Efficiency* (Boston: Houghton Mifflin, 1913), 24.
8. *Ibid.*, 159–60.
9. Spyros Papapetros convincingly argued that such reciprocity had to do with a historical moment in which 'artifacts start having cataclysmic effects on people' – a moment when a vital epistemological shift in the status of objects has occurred, allowing us to identify 'new communicative possibilities that essentially undermine the object-subject divide'. In Spyros Papapetros, *On the Animation of the Inorganic: Art, Architecture, and the Extension of Life* (Chicago: The University of Chicago Press, 2012), vii.
10. Colomina and Wigley, *Are We Human?*, 160.
11. Norbert Wiener, *Cybernetics, or Control and Communication in the Animal and the Machine* (Cambridge, MA: The MIT Press, 1961 [1948]), 29.
12. Lucy A. Suchman, *Human-Machine Reconfigurations: Plans and Situated Actions* (Cambridge: Cambridge University Press, 2007).
13. Donna J. Haraway, 'A Cyborg Manifesto: Science, Technology, and Socialist-Feminism in the Late Twentieth Century', in her *Manifestly Haraway* (Minneapolis and London: University of Minnesota Press, 2016), 34. 'A Cyborg Manifesto' was originally published in *Socialist Review* no. 80 (1985): 65–108.
14. Michael Osman, *Modernism's Visible Hand: Architecture and Regulation in America*, (Minneapolis and London: University of Minnesota Press, 2018), xii.
15. Negar Sanaan Bensi and Francesco Marullo, eds., *Footprint 23*, 'The Architecture of Logistics' (Autumn/Winter 2018).
16. To name a few, Donna J. Haraway blurred boundaries between humans, animals, and machines to move away from traditional feminism in 'A Cyborg Manifesto' (see note 13); K. Michael Hays discussed

the emergence of a posthumanist approach within modern architecture in *Modernism and the Posthumanist Subject: The Architecture of Hannes Meyer and Ludwig Hilberseimer* (Cambridge, MA and London: The MIT Press, 1995); N. Katherine Hayles looked at the questions of embodiment in the information age and how that relates to the emergence of the posthuman in *How We Became Posthuman: Virtual Bodies in Cybernetics, Literature, and Informatics* (Chicago and London: University of Chicago Press, 1999); Rosi Braidotti, *The Posthuman* (Cambridge and Malden MA: Polity Press 2013); Beatriz Colomina and Mark Wigley questioned the boundaries between fleshy bodies and technological addendums in *Are We Human?* (see note 10); urban landscapes shaping the posthuman condition were collected by Mariano Gomez-Luque and Ghazal Jafari (eds.) in *New Geographies* 9, 'Posthuman', (Harvard Graduate School of Design: Actar Publishers, 2017); and the reconceptualisation of architecture through the lens of queer theory and trans studies was explored by Robert Alexander Gorny and Dirk van den Heuvel (eds.) in *Footprint 21*, 'Trans-Bodies/Queering Spaces' (Autumn/Winter 2017).

17. For more on the idea of the corporeal and extracorporeal, see Jean-Didier Vincent, 'Interior Architectures' in Philippe Rahm and Jean-Gilles Décosterd, eds., *Décosterd & Rahm: Physiological Architecture* (Basel: Birkhäuser, 2002), 43–49.
18. Siegfried Giedion, *Mechanization Takes Command: A Contribution to Anonymous History* (New York: Oxford University Press, 1970 [1948]), 714.

## Biographies

Victor Muñoz Sanz is an architect and researcher whose work examines the notion of 'workscape', that is, the architectures and territories of human and nonhuman labour. He holds the degree of Architect from ETSA Madrid, a Master of Architecture in Urban Design from Harvard University, and a PhD cum laude from UPM. Victor was Harvard's Druker Fellow; Emerging Curator at the Canadian Centre for Architecture; co-principal researcher of 'Automated Landscapes' at Het Nieuwe Instituut; fellow at the Akademie Schloss Solitude; and is currently a researcher at TU Delft. He has published essays in *Harvard Design Magazine*, *Bartlebooth*, *Work Body Leisure* (Hatje Cantz, 2018), *e-flux Architecture, Volume, Domus*, and *On Site Review*. His research on automation with Het Nieuwe Instituut was exhibited at the Venice Biennale.

Dan Handel is an architect, researcher and curator. He was the inaugural Young Curator at the Canadian Centre for Architecture, developed exhibitions for the Venice Biennale and Het Nieuwe Instituut, and was curator of architecture and design at the Israel Museum. Handel holds an MArch from the Harvard Graduate School of Design, and a PhD from the Technion Israel Institute of Technology. His writing has appeared in *Harvard Design Magazine*, *e-flux Architecture*, *Thresholds*, *Frame*, *San Rocco*, and *Pin-Up*. He is the editor of *Manifest*, a journal of the Americas and a recipient of grants from the Graham Foundation for Manifest (2012, 2014) and Carpet Space (2019).