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From Cybernetics to an Architecture of Ecology: Cedric Price's Inter-Action Centre

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Following the work of British architect Cedric Price (1934–2003), this article investigates the influence of cybernetics and systems thinking on architectural design during the 1960s and 70s, which can be labelled 'ecological' in today's terminology. Price's works from that period reflect a transformative step, in which the built environment was increasingly understood as a system of human interactions. This evolution will be illustrated using his Inter-Action Centre (1970–1977) as well as some earlier projects, such as the Fun Palace main project (1961–1964), the Potteries Thinkbelt (1965–1967) and the New Aviary (1960–1965).[1]

Today's understanding of 'ecological design' focuses on the reduction of any negative impact of human interventions in a natural system.[2] However, the concept of ecological design developed as early as the beginning of the twentieth century, when scientists, architects and planners began to understand the world as a complex system of flows and processes, evolution, and change as fundamental concepts shaping the human living environment.[3] After World War II, these concepts gained new impetus, not least by technological advances in automation, mass production and information technology. Later referred to as the spatial turn, space was no longer perceived as a container of social activities but as part of a socio-environmental system, or ecology.[4]

Cedric Price was among the first to have this new idea of space reflected in his architectural projects. The analysis of his work shows that he understood the built environment as a system of human interactions, in which design addressed human needs by shaping processes such as use and activity. This new view on functionalism in architecture changed the understanding of architectural design from the production of an object to an instrument of system intervention. Price's system-oriented approach to architecture manifests in the Inter-Action Centre (1970–1977). Often referred to as 'the closest to the Fun Palace and the artless version of the Centre Pompidou', the Inter-Action Centre is one of the very few projects where the architect put these ideas into practice.[5]

In the first part the article discusses the project and Price's specific approach to design. Price began to employ relatively uncommon instruments to organise the design process, including surveys and organisational diagrams, thus demonstrating his understanding of architecture as part of a process that fosters social activities and urban regeneration. His distinct approach is investigated further in the second part of this article. Formative for his ideas and methods was his collaborative work with the cybernetician Gordon Pask (for the Fun Palace main project, 1961–1964) and with the architect and systems theorist Richard Buckminster Fuller (on his proposal for the Claverton Dome, 1961–1963, and the New Aviary, 1960–1965).[6] The Potteries Thinkbelt project (1963–1967) illustrates how Price drew on earlier concepts of ecology, for example by referring to urban pioneer and biologist Patrick Geddes' 'valley section' and his methods of observational studies.[7]

Finally, the last part elucidates that, in the 1970s, cybernetics gave way to ecology as a concept to describe the relationship between humans and the natural environment. In projects concurrent with the Inter-Action Centre, Price moved away from the traditional understanding of architecture as building design. Instead, projects such as Fun Palace Stratford Fair (1974) or McAppy (1973–1976) were temporary and performative in character.[8] Whereas architects like John McHale suggested the adaptation of natural principles in architecture as an ecological design approach, Cedric Price emphasised the role of design as an instrument of intervention in the human habitat, that is, the inter-related fields of the physical, urban, and social environments. In doing so, his understanding of ecological design resembles the modernist idea of the good life as an improvement of the human living environment, simultaneously redefining the nature of architectural design as process-oriented, temporary system intervention.

The Inter-Action Centre

Starting from the well-known Fun Palace project, the work of Cedric Price is frequently referred to as an architecture of technology, using the latest developments of industrial fabrication, media, and information technology to produce high-tech buildings in the tradition of the functionalist machine.[9] Lesser known are the numerous projects of his later work, in which he used small-scale interventions for making space accessible and enabling exchange.

This change in his understanding of architecture becomes evident in the July picture of the Inter-Action group's 1978 calendar, dedicated to the group's newly opened arts and community centre. The image showcases the diversity of a crowd of people visiting an event in front of the building. Whereas architectural images are often marked by the absence of people, here the building seems relegated to the background. Although Price did not choose the picture himself, it represents very well his idea of the project as a facilitator of interaction, with the centre being at the heart of the community. [Fig. 1]

The Inter-Action Centre was the result of more than seven years of planning by Cedric Price's architectural office and more than a decade of community work and social activism of the local community groups Talacre Action Group Ltd. and its successor, Inter-Action. Both groups had started performing agit-prop theatre and touring the streets of North London. Later they extended their programme and organised a variety of activities for the inhabitants of the neighbourhood.

Such movements emerged against a background of widespread lack of development of the urban environment and public space in London's former working-class neighbourhoods, including Kentish town where the Inter-Action Centre was located. While London's inner city was already rebuilt and well on its way to becoming a major financial centre of the rising global economy, a large part of the city's working-class neighbourhoods was still in a state of disarray and decay. After the slum clearance programme in the 1960s had replaced many of the nineteenth-century workers' houses, wastelands still needed to be redeveloped, with public space, functioning high streets and other venues missing. The Inter-Action Centre was thus closely related to the idea of urban regeneration, in which newly built space would facilitate the creation of a new social space, both for the community and the neighbourhood as a whole. [Fig. 2] Accordingly, the centre was planned as part of a larger open space dedicated to the neighbourhood by the Borough of Camden. It was to host the group's various activities that were already taking place in multiple locations around the district.[10]

When the centre opened in April 1977, Inter-Action had 1 500 members and sixty full-time employees.[11] These members were engaged in multiple activities, including education, community welfare, and theatre; they hosted ateliers and media workshops and offered support in city farming at

Fig. 1

Fig. 1: 'West Kentish Town Neighbourhood Festival', Inter-Action Community Calendar, 1977, Cedric Price Archive, CCA, Montréal, Document folio DR:1995:0252:632:015:001:007.

London's first urban farm, which the group had established in 1971. All the group's activities shared the idea of improving the neighbourhood's inhabitants' living environment through activities that promoted communication, engagement and, thereby, learning.[12] The group's diversity of activities and participants was lauded in the press conference on the occasion of the centre's inauguration and seen as an accomplishment worthy of the new, more individualised society which didn't rely on governmental institutions but responded directly to the public and local interests.[13]

Theatre director David Berman had established Inter-Action as a charitable trust in 1968, dedicated to community work with the goal of 'breaking down ethical class and temperament barriers' within the neighbourhood.[14] Representing a novel approach to small group work, Inter-Action worked with interactive theatre and games as new forms of citizen engagement with the intention 'to make arts more relevant in the community'.[15] For example, in the environment game, participants could learn to use modern media and communication technology and produce videos about their everyday life. As Berman writes in the organisational statement of Inter-Action, this bottom-up approach to community work ought to have a scaling effect, facilitated by the new community building. In his vision, the Inter-Action Centre was to become the starting point of a social movement that would lead to an expanding network of community centres. The Inter-Action Centre was to be 'the first ripple … to set out', then expanding to 'the Borough of Camden, then the inner London area in general and the next ripple would be obviously the various parts of England'.[16] Accordingly, design goals for the centre evolved from focusing on fixed spaces to the provision of multiple adaptable spaces that would support the interests of the various groups and facilitate future networking. These two considerations gave room to the idea of a flexible organisation of the programme and the responsive organisation of space as preliminaries for the centre's design.

When Cedric Price was selected as the centre's architect, he was already well known for his design of a similar adaptable performative space, the Fun Palace. Price had developed that project for agit-prop theatre director Joan Littlewood and the Fun Palace Trust seven years earlier. In this ultimately unrealised project, the architect designed an adaptable mega-structure that would respond to its users' needs through cybernetics and technology. The same principles informed the design of the Inter-Action Centre. All group activities were to take place literally under one roof, which Price designed as an open, two-story steel frame, providing a division between different inside and outside spaces.[17] Apart from a roofed main hall, he attached prefabricated plug-in portacabins to the structural framework. Price had planned these rooms to be exchangeable over time, depending on specific functions and demands expected to vary over the building's lifetime. Modules included, for instance, a media workshop and rehearsal rooms. Simultaneously, the structure defined open spaces in which various enclosures could be added, such as a Fun Arts bus that toured the neighbourhood for theatre performances or the local day nursery in the form of a Finnish log cabin. All these rooms functioned individually and were supposed to be replaced or added when necessary.

While both the Fun Palace and the Inter-Action Centre focused on creating performative spaces dedicated to community work, their designs differed significantly in size and formal expression. With a steel structure that was to be ten stories high and measured approximately 250 by 125 metres, the Fun Palace was designed as a giant machine. It employed automated cranes and movable platforms that were to be controlled by computer technology. Its capacity to host more than five thousand people at a time, both in large and various small-scale events, made it a monument for the mass society of the newly emerging information age. In comparison to such a headlines-making project with its interactive building hardware, the design of the

Fig. 2

Fig. 2: 'Your playspace needs you Talacre Action Group NWS and Inter-Action' poster, ca. 1971, designer unknown, Cedric Price Archive, CCA, Montréal, Document folio DR:1995:0252:632:014:002.

Inter-Action Centre was low-tech and small-scale. Instead of cybernetic control and advanced building technology, the core of the design was the idea of slow adaptation and change of use over time.

Price placed particular emphasis on the process of changing activities and programmes. The building was erected in three stages, with the roof and structural framework built on-site already in 1974, three years before the building's opening.[18] In parallel, the outdoor facilities were constructed, including a playground, a stage, a square walkway, and a football pitch.[19] In that first stage, the building was designed as part of an outdoor space that provided basic infrastructure for community work and created a sense of place and community. [Fig. 3] With the fundraising completed in 1976, the main hall and plug-in rooms were added to the structure, whereas additional spaces, such as the Finnish log cabin, joined the centre just before the opening in 1977.[20] The RIBA journal commented on the time-phased construction of the building as the true expression of a user-oriented design approach: '[Inter-Action] is concerned with the rarest and most valuable resource of all, one of which we cannot afford to waste, *people,* their spirit to do things … and to change their minds.'[21] Being part of the neighbourhood system of social interaction, the design of Inter-Action, therefore, seemed to be 'the true definition of the ageing of a building. It has something to do with growth as well as with final destruction.'[22]

Re-programming the city

The need for rooms and spaces that respond to the temporary nature of peoples' activities required new tools to gather information about the users' intentions. For this purpose, Price began to use questionnaires. He thus surveyed the different groups within Inter-Action about their preferred use and social activities. This information formed the basis for a series of diagrams, such as an activity frequency sheet that displayed the groups' activities, their need for space, and possible adaptation over time.[23] However, as office member Will Alsop later recalled, due to the dynamic of the different needs and interests of the groups involved at the beginning of the project, 'the brief changed every two weeks'.[24] These diagrams presented the temporal order of supported functions, for example the building's weekly use cycles or the relationship between different applications and the required spaces both in and outside the building. Price then categorised each activity-space into a modular size, which could be incorporated into the structural matrix in any number of ways. [Fig.4] This approach gave him an idea of the size of rooms and the design of the overall structure needed to accommodate any specific programme.[25]

Price had started to focus on space usability as a design criterium early in his career. Such design-driven survey methods played a central role in the Fun Palace design and, later, in the Generator (1977–1984), a design for a rehearsal retreat and performing arts centre in Florida.[26] Similarly, in his regional plan for a decentralised university campus in the industrial region of Stoke-on-Trent, Potteries Thinkbelt, he used statistical information and aerial photography to conduct a regional 'survey of occupation' to map potential sites and uses for redevelopment. In doing so, he referred to Patrick Geddes and his method of civic survey, exemplified in his 1918 study of the working class in Edinburgh. Geddes's ideas on city planning had surfaced again after World War II through the republication of his works at universities, including the Architectural Association (AA) School of Architecture in London, where Cedric Price got to know Geddes's work. In his concept of co-evolution, Geddes had described the city as a dynamic system of interaction between humans and their environments, where he distinguished human-made, natural and technical settings.[27] From this perspective, an intervention in any of these realms could facilitate change in the city as a whole.[28] For Geddes, careful observation and analysis were, therefore, the first steps before suggesting any particular spatial intervention within the broader framework of the city.[29]

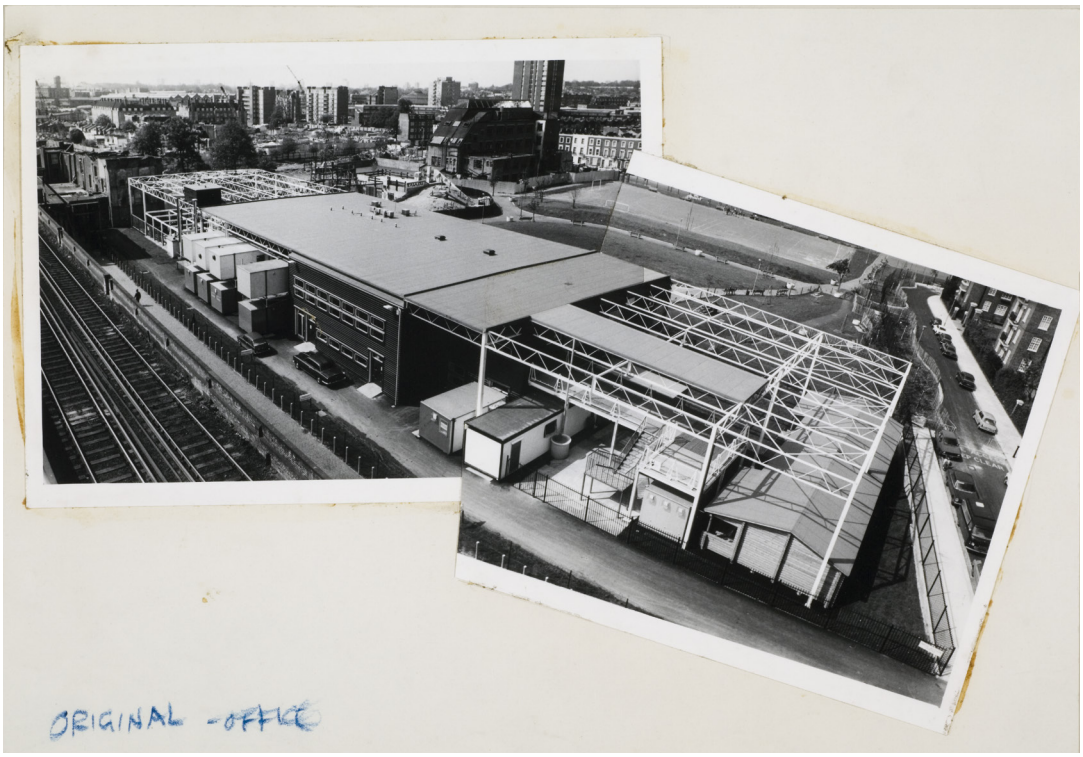

Fig. 3

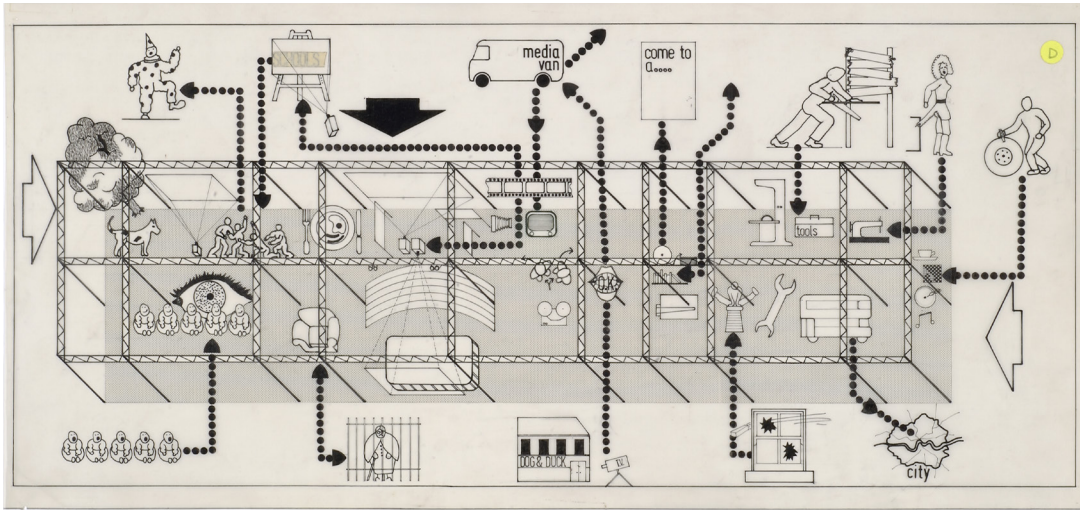

Fig. 4

Fig. 3: Cedric Price Architects, 'Photomontage Inter-Action Centre', Camden Town, London, ca. 1976, Cedric Price Archive, CCA, Montréal, Document folio DR:1995:0252:632:014:001.

Fig. 4: Inter-Action Centre, axonometric diagram, Cedric Price Archive, CCA, Montréal, Document folio DR:1995:0252:621.

During the 1970s, Cedric Price extended his set of survey methods to include qualitative methods and fieldwork. In the McAppy project that he conducted in parallel to the design of the Inter-Action Centre, his team used participatory observation together with interviews and spatial mapping to investigate the work environment on the construction sites of the McAlpine company. The project used both civic surveys and observation of workers' behaviour to propose measures to improve on-site working conditions. Consequently, the final product was not a building but a manual with suggestions for spatial and organisational change within the company.[30]

The emergence of this new way of collecting data, as well as the drawings in Price's architectural design process, suggest that Price did not see architecture primarily as the design of an object, but rather as the organisation of activities and change within a cultural system. Furthermore, it shows that the architect became an observer of the built environment and the activities taking place in it. A rational analysis should then allow for reliable conclusions and serve as a guide for specific ideas on how to use spatial design or enable improvements within an already existing system of relationships. Thus, the architect's role turned into that of an observer, analysing the city and its social activities and employing scientific methods to gather information on the use of space or the preferences of the people who use it. The architect was furthermore charged with providing the imagery of construction and use, as well as illustrating the project's promise to the community. For this task, his studio produced specific drawings with simple axonometric representations of the building, illustrating the various activities and their relationship to other functions and the surrounding neighbourhood. [Fig. 5]. He was also asked to create images that could be used for fundraising and public relations, as well as for the different members of the group itself who were in search of 'a more graphic way of bringing the building to life for us who are laymen'.[31] The need to communicate the design's flexibility to laypeople, in particular, can be seen as a result of his activity-centred design approach.

Focusing on the users and the configuration of their activities in space, Price regarded his work on the Inter-Action Centre as a laboratory to create, parallel to the built space, a new social space. Price perceived architecture as part of an interactive system, comprising not only buildings but also people and their actions. Accordingly, he became an attentive observer of the surroundings and an investigator of user groups' different needs. This strategy of 'an architecture of appropriation' was tested again when the brewery company Whitbread eventually bought parts of the Inter-Action Centre to insert a mock-Tudor pub inside the structure. Price was very pleased with the final intervention.[32] Taking a holistic approach, he viewed his architecture as a cultural product of people's activities and interactions, which consequently required a new design approach. As he stated in a 1976 lecture on the design of the Inter-Action Centre, 'the time element of when a building is useful for its users or its operators was blurred. This can only happen if there's a conscious effort for looseness in the structuring of the original design.'[33]

His work on the Fun Palace and the Inter-Action Centre represents a departure in his design approach from the one followed in his earlier projects. In his designs for small houses, extensions and refurbishments, for example the redesign of the Moyston Hotel bar (1960–1964), the Robert Frazer Gallery (1961–1962) and the construction of a cottage in High Legh (1961–1965), Price followed the popular modernist aesthetic of that time. Designs from the beginning of his career were informed by the common goal of optimising the transition from preliminary design to construction. However, he began to question the idea of housing design in the High Legh Cottage and suggested that the client should consider the building's lifespan and possible changes of use over time.[34]

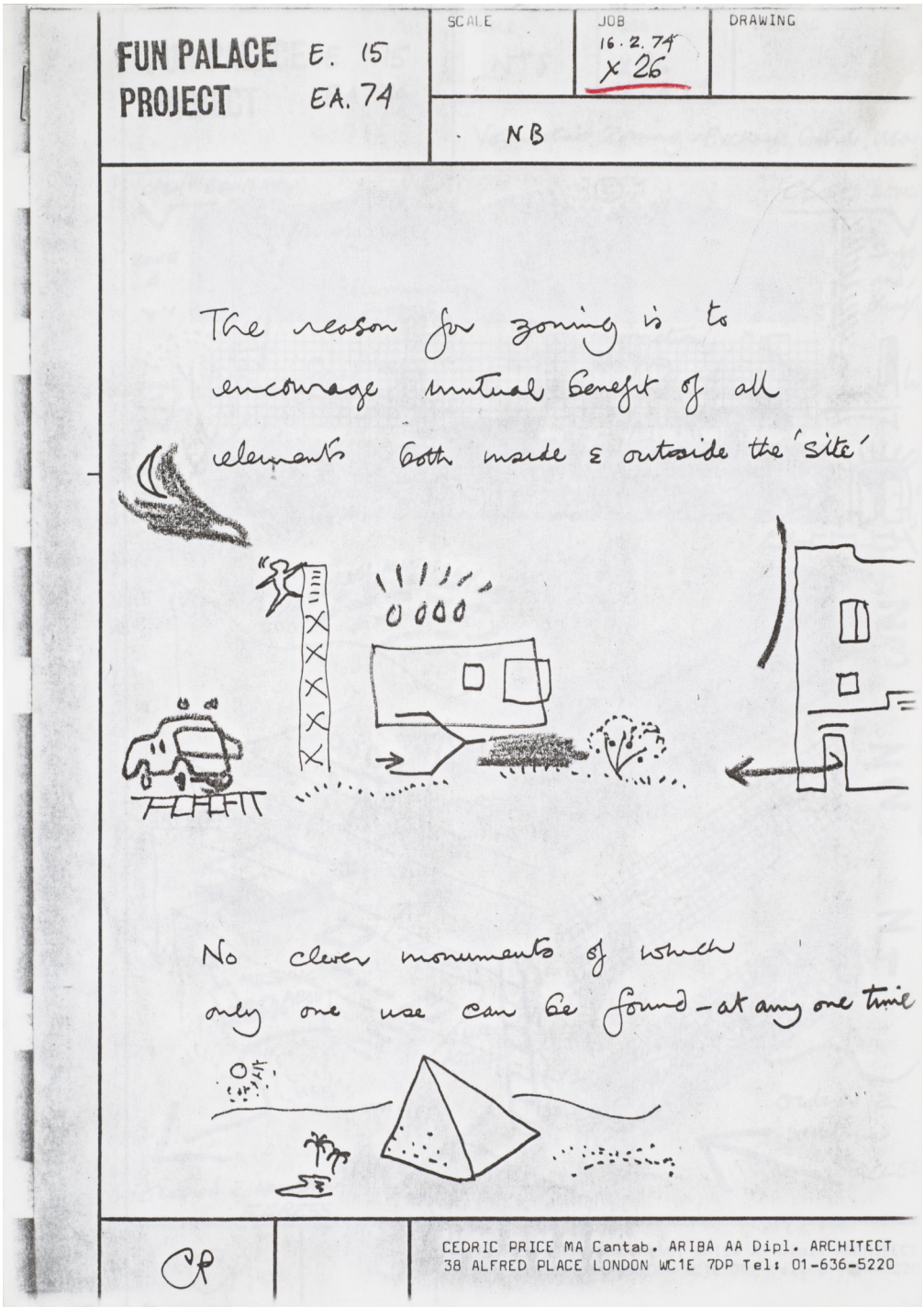

Fig. 5

Fig. 5: 'Volumetric Zoning: Fun Palace Project Easter Fair', sketch by Cedric Price, dated 16 February 1974, Cedric Price Archive, CCA, Montréal, Document folio DR:1995:0188:525:001:018.1.

The Fun Palace as a cybernetic system of interaction

Price's encounter with the cybernetician Gordon Pask (1928–1996) turned out to be decisive for his understanding of ecological design. Within their collaboration on the Fun Palace control system, Pask introduced Price to systems thinking, self-regulating systems, and other concepts relevant to machine-human interaction. Pask arguably brought cybernetics into the mainstream. As a trained scientist with a doctorate in psychology, he dedicated his work to educational technology and a scientific theory of learning. These interests included the application of cybernetics through the construction of interactive learning environments. He recognised in architectural design the potential for a holistic approach to designing environments of interaction. His involvement in the Fun Palace project proved to be a formative influence on his dedication to architecture and architectural education. As a critic and teacher at the AA School of Architecture, for example, he promoted the application of systems thinking to architectural design and educational technology.[35]

In the Fun Palace project, both Pask and Price were members of the so-called Cybernetics Committee, which developed ideas for the building's use and programme in relation to its spatial design. The aim was to create the Fun Palace as an open environment with an indeterminate program, made possible by the support of high-tech machinery, including air conditioning, a flexible façade of movable plastic panels, closed-circuit television, and so on. It comprised the hardware to the cybernetic control system that was to ensure openness of use.[36]

Gordon Pask developed the Fun Palace as a self-regulating machine that could adapt to its visitors' needs. The basis of this adaptable architecture was the combination of a cybernetic control system, which regulated the interaction between high-tech machinery and humans, and an architecture that implemented the mechanics of movements and atmospheric changes. Based on the idea of a theatre stage and stage technology, large cranes were to reposition the rooms in the Fun Palace, and light, acoustics, and climate could change autonomously. Its control system, which translated the various user groups' input into different spatial configurations, allowed the Fun Palace to change continuously.[37]

The cybernetic system specified roles and hierarchies of the actions that were to take place depending on the input. By defining the levels of communication and feedback, it turned the building into a performative machine. It created a dialogue and communication system that processed information about the functions and organised them spatially in the building. By establishing a form of continuous two-way interaction with its users, the Fun Palace became a genuinely interactive system, creating not only a new architecture of performance but an environment with its own dynamic processes of adaptation, change, and renewal.[38] With the help of cybernetics, the Fun Palace was to become an environment 'suited to what you are going to do next' and 'indeterminate participatory open-ended situation'.[39] In this sense, the architect and the cybernetician designed a self-contained environment that could potentially continue to evolve without further supervision. In the minds of its inventors, architecture went from imposing a particular spatial structure on its users to a self-organising space that could react naturally to their input. Like its inhabitants' relationship to their surroundings, architecture gained a fundamental characteristic of the concept of ecology as an environmental system *avant la lettre*.

Common to all the system's different components and at the centre of Pask's work as a cybernetician was the idea of interaction between people and machines in a dynamic system of communication. Pask had based the Fun Palace's cybernetic system on the concept of processual development, which he had defined in 1961.[40] Instead of being pre-defined by the system's initial

conditions, the Fun Palace's cybernetic system was based on continuous dialogue, which allowed user interaction to evolve by means of communication. Pask used the term 'conversation' to describe this process. This would lead the Fun Palace to be self-organising and to learn from previous inputs to create different and ultimately unpredictable new spatial configurations.

Although on a much smaller scale, Pask had already developed a similar dialogue system before. His plans for Joan Littlewood for a cybernetic theatre would have allowed the audience to influence the play's progression by an electronic feedback system. The audience was thus enabled to participate actively and influence the stage performance allowing for a more situational play. Pask used cybernetics here to understand and construct an open system that focused on the dynamic process of social interaction. Through formatted content and the possibility of adaptation, the system was expected to evolve and learn. In his theory of learning, learning is derived from conversation and channelled according to different styles, strategies, or configurations of learning environments.[41] He applied these ideas to technological devices by constructing systems and settings that would promote discussion and understanding. In this sense, he viewed the Fun Palace's cybernetic system as a learning system and the building itself as a learning environment that would evolve.

In their approach, Pask and Price followed a general trend in cybernetics, moving away from its primary focus on applications in weapons systems during World War II to a post-war science that adapted systems thinking to improve civil society. Terms such as command, control, and information became part of the general vocabulary, regardless of whether they addressed biological organisms, automatons or societies. Related theories promised not only approaches to a new unity of knowledge but also new regulatory mechanisms for a wide variety of social problems.[42]

Ecology

Like for Price, the work on the Fun Palace was also a decisive experience for Pask who later explained that architecture offered ideal conditions for the inclusion of systems thinking.[43] His work created the conceptual basis for a new understanding of architecture as an instrument of change within a broader environmental and social context. Dedicated to the design of the built environment, architecture had the potential to unite competing concepts from different disciplines, including sociology, economics, engineering and biology. Particularly relevant was its interdisciplinarity and holistic approach to knowledge production in order 'to yield a broad view of such entities as "civilisation", "city" or "educational system".'[44] In that sense, Pask provided the conceptual blueprint to Price's work: through the construction of new environments, architecture dealt not only with the built space but also had the potential to affect the social space.[45]

For Cedric Price, the introduction to cybernetic ideas led to a new approach to architectural design. In the concept of radical constructivism, architecture became an instrument that determined its users' possibilities of action. According to this view, the architect became a programmer of opportunities. Architecture was not only part of a system of human interaction but became part of a more extensive system of the built environment, which was continually evolving and creating new situations and ideas. This led Price to the realisation that the architectural discipline had to adapt. Consequently, in 1966 he advocated a greater recognition of time and process as design criteria: the architectural profession was too fixated on form and representation 'as a provider of visually recognisable symbols of identity, place and activity'.[46] And he suggested that the architect should instead 'aim for the improvement of quality of life as a direct result of architectural endeavour'. Contrary to the tendency that defines architecture's function as mainly representative, Price saw his profession's role in the design of spatial interventions that would stimulate a region's

socio-economic system and foster social stability and cohesion.[47] And he warned that 'the possibility should not be ignored of Great Britain's becoming an increasingly imbalanced community primarily involved in servicing other countries and providing facilities for hardy historiphile holidaymakers.'[48]

With their ambition to promote and support social values such as equality, self-help, and self-expression, Price's designs fit well into the tradition of the modern avant-garde, whose architecture was dedicated to improving the living conditions of the working class. While he worked on transforming concepts such as user, function, and flexibility, which were rooted in the ideas of modernism, he also broadened modernism's perspective through his process-oriented understanding of space as an interrelated system of spatial environment and social community.[49]

Price first applied the idea of ecological design in 1974 when he designed the Stratford Fair. Around this time, Joan Littlewood had redirected the Fun Palace Trust's activities to the neighbourhood of Theatre Royal, where she started an effort to revitalise the neighbourhood with a playground called Stratford 48. For the annual funfair, Price divided the area into several three-dimensional zones, each with different heights and technical equipment such as stage scaffolding, sound systems and lighting, each providing a different impact on the connectivity and accessibility of the space and its surroundings. In this way, he designed a performative environment intended to create particular situations of interaction and promote the site's close interrelation with the neighbourhood. The idea was that on the site, the people, their activities, and the various spatial qualities should be in constant flow. As Price explained in his sketch of the setup, it was 'no clever monument of which only one use can be found at any time'.[50] This was to be the opposite of what current representational architecture could achieve. [Fig. 6]

By applying a cybernetic viewpoint, the Stratford Fair's architectural design made no distinction between people on the one hand and objects, technology, and material on the other. Everything was seen as part of one organic system, an ecology in which the functions and processes of the natural environment, such as climate, sound, and light, as well as the human need for conviviality could be integrated and reproduced in an artificially created, human-made system.[51]

Seeing architecture as an instrument for intervention in a broader social and built environment such as an urban neighbourhood, reflected an openness to the idea of systems thinking that did not stem from Pask's cybernetic vision of social control, but rather from Price's interactions with Buckminster Fuller. The American engineer provided Price with an approach to using design as an instrument of change within a system. For him, architecture and engineering provided infrastructure to the built environment, which would establish a new balance between the natural world and human needs. The architect's role was, therefore, to transfer the knowledge of science to engineering. In his vision of 'planetary planning', Fuller went so far as to see the earth as one interlinked organic system of flows that humanity could redirect and optimise by using science and engineering. As Fuller's work suggested, ecological design aimed to preserve natural systems and develop new tools that reproduced the principles of nature in design. In his understanding, the architect was an engineer and inventor who contributed to improving human life by redirecting socio-economic processes through system intervention.

Price had already been introduced to Fuller in 1958 who mentored Price after opening his office in 1960. Fuller allowed Price to use his dome patent in his Claverton Dome project (1961–1963) and supervised his design for the New Aviary (1960–1965), in which Price employed Fuller's structural concept of tensegrity.[52] In both projects, Price applied Fuller's idea of architecture as systems engineering. In his design of the aviary, he used methods to improve the structure by testing materials, examining construction details, and studying

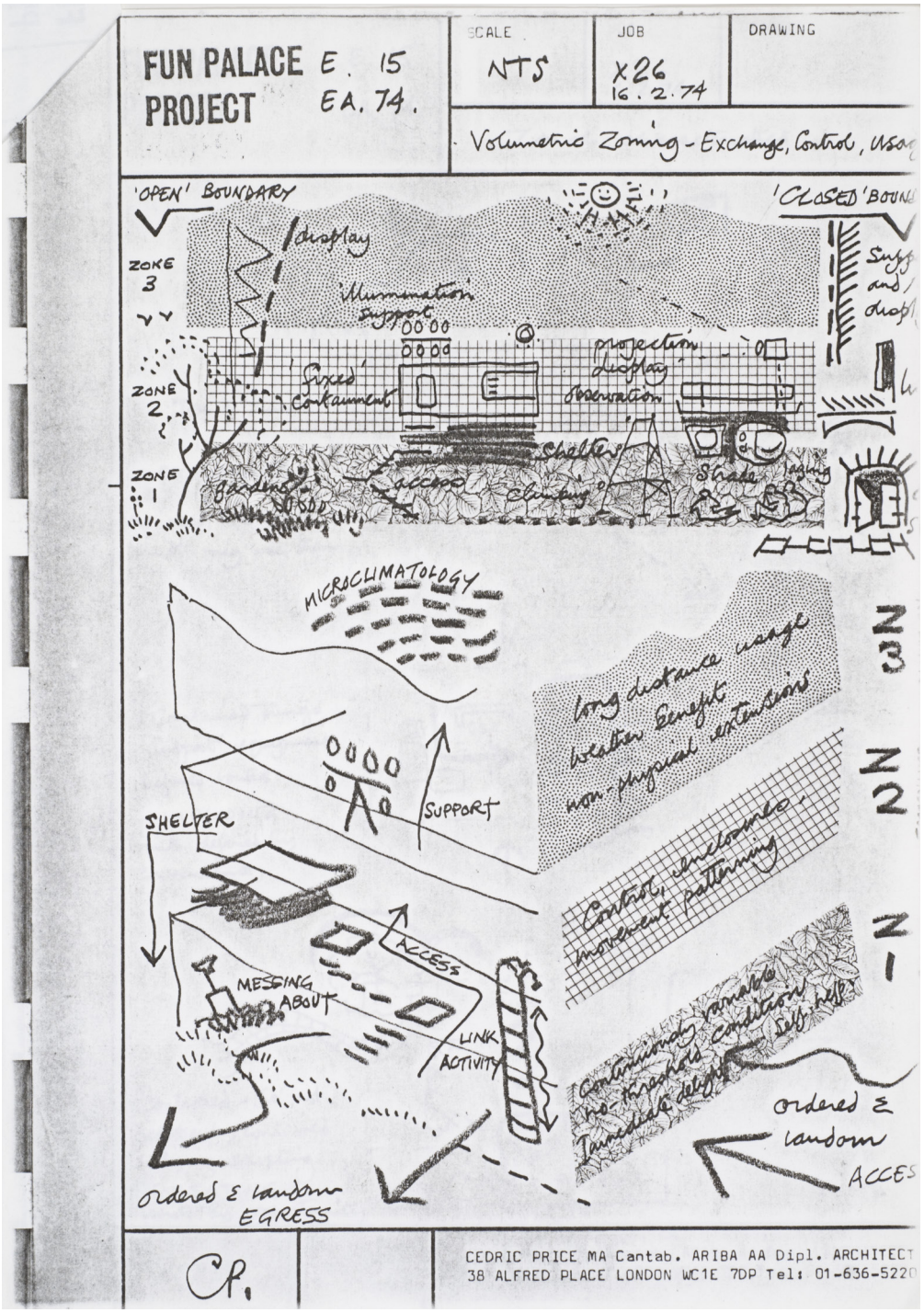

Fig. 6

Fig. 6: 'X26: Fun Palace Project', Easter Fair, sketch by Cedric Price, 16 February 1974, Cedric Price Archive, CCA, Montréal, Document folio DR: 1995:0188:525:001:018.2.

the environmental conditions inside the building. Price tested soil samples and studied vegetation growth to improve the walk-in aviary's usability as a 'place of public interest and enjoyment'.[53] In the New Aviary project, Price attempted to replicate a natural system through design. In the Fun Palace, he applied the same design approach of systems engineering while focusing on replicating a social system by creating an artificial environment aimed at stimulating learning and cultural activities. Between 1960 and 1966, he worked on both projects almost in parallel. Both designs focused on an ecological system in which architecture was to establish a new relationship between the social and built space.

With the rising awareness of the scarcity of resources, increasing consumerism, and population growth in the late 1960s, Fuller's ideas became more common within a circle of young architects, including Fuller's long-time collaborator and friend of Price, John McHale. McHale extended Fuller's concept of ecological design to the development of design principles and tools.[54] As much as the design of an object, building, or territory, from a planetary-planning perspective, McHale understood ecological design to be the design of organic systems through technological mediation or engineering.[55]

Price continuously adapted this radical way of thinking about architecture as an instrument of system intervention throughout his work. While projects like the Potteries Thinkbelt focused on designing a large-scale regional network and educational system as a starting point for revitalisation, smaller projects like the Inter-Action Centre focused on a single component within a larger network of spatial interventions. Projects such as South Bank (1983–88), Ducklands (1989–1991), or Magnet (1995) show that Price continued to develop this topic throughout his career.[56] With his proposal for the giant Ferris wheel on London's South Bank and his small-scale infrastructural intervention in his Magnet proposal, he presented architecture as an urban catalyst that would stimulate social and economic change within a broader environment. He reduced his designs increasingly towards minimal interventions that focused on improving the human habitat. In his Ducklands proposal, his view of architecture as a system intervention went so far that he proposed parts of the harbour area to become a nature reserve, accessible both to migratory birds and the citizens of Hamburg.

Whereas the biologist Ernst Haeckel had coined the term ecology to refer to the relations of organisms to both one another and their physical surroundings, at the beginning of the twentieth century the term was increasingly used to refer to the city as a living organism. As the Greek word *oikos* means 'household', 'home' or 'place to live', the concept of ecology also applied to the human habitat as a place of social interaction, be it a house, a neighbourhood, or an urban region. In 1915, Patrick Geddes, for instance, claimed a homology between nature and the city.[57] He thought of both cities and natural settings as ecosystems encompassing the flow of energy, matter, and both human and non-human organisms.[58] In his work as an urban planner, he favoured small-scale interventions that would serve 'primary human needs' over large-scale urban designs. This approach was later described as 'conservative surgery' and the idea of architecture as systems intervention finds an echo in the later works of Cedric Price.[59]

Thanks to cybernetics, the idea of ecology changed after World War II to a more integrated vision in which the natural world was no longer seen in opposition to the human-made world. However, with the first United Nations resolution on environmental policy, published in 1972, the idea of ecology and the corresponding systemic view on the world had gained new political relevance.[60] It recognised that modern scientific and technological developments had altered the relationship between humans and their environment profoundly. The resolution was intended to acknowledge both technology's unprecedented opportunities for human development while also recognising the accelerating destruction of the human living environment.

Science and technology were understood both as instruments for the exploitation of resources and compensation for their negative impact. Moreover, social activism showed itself to be a counter-reaction to modernist planning, as it saw the limits of architecture in its inability to meet its inhabitants' needs.

In this new way of thinking about architecture, contextualisation and the faculty for dialogue should help to reconcile the social space with the built space. Furthermore, a new bottom-up approach was to facilitate the residents' identification with the living environment. While an intellectual elite gave voice to these demands in the 1960s, among them Jane Jacobs, Kevin Lynch, Denise Scott Brown, and Robert Venturi, similar ideals also began to emerge at the beginning of the 1970s in grassroots movements and community initiatives in London. Like many others, both the Inter-Action group and Joan Littlewood's Theatre-Workshop started their engagement in community work where the idea of ecology came to the fore through advocacy for the common good.

If the Inter-Action Centre may not appear at first glance as a genuine example of such an ecological approach, this may reflect a rather narrow understanding of ecology, that is, in the context of the natural environment only. Yet without the neighbourhood's social fabric, its use of architecture as an active agent to improve citizens' lives by offering space, programmes and activities would have been unthinkable. Such a reorientation of architecture also met, of course, with criticism. The main points of critique were the approach's adherence to and reliance on observation, description, and application of scientific methodologies. At the same time, however, its emphasis on education and learning undeniably promoted values such as sociability, equality, and the improvement of life. This topical alignment led it to join systems thinking with learning and self-improvement. The design and use of the built environment should reflect these values and actively contribute to their realisation. Consequently, the ideal of ecological design in the Inter-Action Centre also contained a robust ethical imperative. The public perceived it as a showcase project that would foster a better life through creativity and social interaction.

For Cedric Price, the Inter-Action Centre represented a culmination of the various ideas and approaches to systems thinking that he had encountered during his work in the 1960s. In the project, his relational approach to architecture, which emphasised the link between material resources and the possibility of individual action, that is, between information, space and social order, became fully apparent. This new attitude towards architecture as a system or ecology explains many of his subsequent projects' polymorphism. He applied design as an active agent to intervene in already existing environmental systems. A log cabin, like the one in the Inter-Action Centre, the new hard hat invented for the McAppy project, or a bird sanctuary could each represent a suitable artistic instrument to stimulate improvement of the built environment. In this sense, the design of the Inter-Action Centre marks the passage from the observation of a system of social interaction to 'the intentional instrumentation of new systems as active agents'.[61] Following the tradition of Patrick Geddes's co-evolution, Cedric Price used design to foster a new form of dialogue and open up an altered spectrum of action for the individual users.

More telling, however, is how Price's architecture shows the consequences of the paradigm shift from architecture seen as a representational artifact to architecture as part of an ecology. Consistently, when his Inter-Action Centre was proposed for inclusion in the list of British cultural heritage sites, Cedric Price took the unprecedented step of lobbying against such preservation.[62] Instead, he argued that his building should be demolished to make room for a new one, one that was better suited to the demands of today's users.[63] Shortly before his death in 2003, Price was asked if he would not feel nostalgic seeing the great architecture of the 1960s

disappear. As a true proponent of the process-based architectural approach, he just briefly stated: 'Nostalgia for the 1960s, it is laughable.'[64]

Notes

1. Cedric Price left behind only two buildings: the Inter-Action Centre, demolished in 2003, and the London Zoo Aviary. Most other projects were abandoned in an unfinished state. His lasting influence stems rather from his teaching activities, contributions to conferences, editorials and similar small-scale publications. See among others: J. Stanley Mathews, 'An Architecture for the New Britain: The Social Vision of Cedric Price's Fun Palace and Potteries Thinkbelt', Ph.D. Thesis, Columbia University, 2003; Samantha Hardingham, *Cedric Price Works 1953–2003* (London: AA Publications, 2016); Tanja Herdt, *The City and the Architecture of Change: The Works and Radical Visions of Cedric Price* (Zurich: Park Books, 2017).
2. Lydia Kallipoliti, 'History of Ecological Design', *Oxford English Encyclopedia of Environmental Science* (Oxford: Oxford University Press, 2018).
3. György Kepes, *Art and Ecological Consciousness* (New York: G. Braziller, 1972).
4. Barney Warf, *'*Spatial Turn*'* in *Encyclopedia of Geography*, ed. Barney Warf (Thousand Oaks: SAGE Publications, 2010), 2669.
5. Sutherland Lyall, *The State of British Architecture* (London: Architectural Press, 1980).
6. The date for the Claverton Dome refers to the end of the project design. It diverges form the date given by Samantha Hardingham, who suggests 1961–1964, taking into account all documents written on the project. Hardingham, *Cedric Price Works*. The date for the New Aviary refers to the public opening of the building in 1965. It diverges form Samantha Hardingham, who suggests 1961–1964, taking into account all documents written on the project. Ibid.
7. Whereas Samantha Hardingham dates the Potteries Thinkbelt to 1966–1967, the CCA lists the project 1963–1966. 1963 was the year when Cedric Price started his writings on the educational reform plans of the British government. Ibid., and Archival document no. 64/18 'sidings, tracks & station using' dated 23 March 1965. Cedric Price Archive, CCA, Montréal, Document folio: DR:1995:0216.076. Patrick Geddes, 'The valley section from hills to sea', New York City, 1923. Lecture given at the New School of Social Research, published in: Patrick Geddes, *Cities in Evolution*, new, revised edition (London: Barnes and Nobles, 1959).
8. The performative nature of Price's work is understood in the context of Doreen Massey's relational approach to place, in which she links space and place to their social organisation. In this conceptual framework, organisations are seen as being enacted through meaningful interactions, which include human and non-human actants. Doreen B. Massey, *For Space* (London: Sage Publications, 2005).
9. Mary Louise Lobsinger, 'Cybernetic Theory and the Architecture of Performance: Cedric Price's Fun Palace', in: *Anxious Modernism: Experimentation in Postwar Architectural Culture*, ed. Sarah Williams Goldhagen and Rejean Legault (Cambridge, MA: MIT Press, 2000), 98.
10. The Borough of Camden gave Inter-Action a twenty-seven-year land-lease on the site. Hardingham, *Cedric Price Works*, 315.
11. 'Londoner's Diary', *The Evening Standard*, 19 April 1977.
12. Win Caldwell, *Report on Remedial Education* 02/1972, no. 1 vol. 1, 28, Cedric Price Archive, CCA, Montréal, Document folio: DR:1995:0252:632:16/17.
13. Sutherland Lyall, 'Funpalace Mark II', *Building Design,* 22 April 1977.
14. Caldwell, *Report on Remedial Education,* 28.
15. Inter-Action trust director David Berman used this approach for purposes ranging from therapy to entertainment. 'Project Inter-Action, General description', Report III, Council for Cultural Co-operation Council of Europe, Symposium Rotterdam, 5.–9.10.1970, Cedric Price Archive, CCA, Montréal, Document folio: DR:1995:0252:632:16/17.
16. Ibid.
17. Nathan Silver, 'Hypercandid', *New Statesman*, 6 May 1977.

18. Ibid.; Hardingham, *Cedric Price Works*, 329.
19. In this sense, the roof of the Inter-Action Centre had the character not of a building but of an outdoor pavilion in a park. The outdoor facilities were not designed by Cedric Price. Cedric Price Archive, CCA, Montréal, Document folio: DR:1995:0252:632:1/31
20. Silver, 'Hypercandid'.
21. Author unknown, 'Inter-Action Centre', *RIBA Journal* (November 1977): 458–59, cited in: Hardingham, *Cedric Price Works*, 317.
22. Ibid.
23. Cedric Price, 'Activity Frequency Sheet Sketch 102/156, Inter-Action Centre', undated, CCA, Montréal, Document folio DR:1995:0252:621:16/17.
24. Samantha Hardingham, interview with Will Alsop, 14 December 2014, in: Hardingham, *Cedric Price Works*, 316.
25. Mathews, 'An Architecture for the New Britain', 302.
26. Herdt, *The City and the Architecture of Change*.
27. Volker M. Welter, *Biopolis: Patrick Geddes and the City of Life* (Cambridge, MA: MIT Press, 2002).
28. Kallipoliti, 'History of Ecological Design'.
29. Price reflected this observational approach and Geddes's understanding of the city as an organic whole in his 1962 project Circlorama, in which the inhabitants of Glasgow could get information on the impact of urban redevelopment schemes through observation of the city. Herdt, *The City and the Architecture of Change*, 64.
30. Ibid.
31. Letter from E.J.B. Rose to Cedric Price dated 30 March 1976, CCA, Montréal, Document folio DR:1995:0252:632:16/17.
32. Will Hodgkinson, 'If it works, scrap it', *The Guardian*, 3 May 1999.
33. Cedric Price, 'Technology is the Answer, But What Was the Question', recorded lecture. Monica Pidgeon Audio, 1979. As cited in: Hardingham, *Cedric Price Works*, 316.
34. Hardingham, *Cedric Price Works,* 119.
35. Peter Silver et. al., 'Prototypical Applications of Cybernetic Systems in Architectural Contexts: A Tribute to Gordon Pask', *Kybernetes* 30 (2001): 902–20.
36. Herdt, *The City and the Architecture of Change.*
37. Ibid.
38. Lobsinger, 'Cybernetic Theory and the Architecture of Performance'.
39. Reyner Banham, 'Softer Hardware', *Ark* (Summer 1969): 11.
40. Gordon Pask, *An Approach to Cybernetics* (New York: Harper & Bros, 1961).
41. Gordon Pask, 'Styles and Strategies of Learning', *British Journal of Educational Psychology* 46 (1976): 128–48.
42. Michael Hagener and Erich Hörl, eds., *Überlegungen zur kybernetischen Transformation des Humanen* (Frankfurt am Main: Suhrkamp, 2008).
43. Gordon Pask, 'The Architectural Relevance of Cybernetics', *Architectural Design* (September 1969): 494–96.
44. Ibid.
45. Ibid.
46. Cedric Price, 'PTb Life conditioning', *Architectural Design* (October 1966): 483–84.
47. Another prime example of this view is his design of the Potteries Thinkbelt. Ibid.
48. Ibid.
49. Addressing modernist concepts, see: Adrian Forty, *Words and Buildings: A Vocabulary of Modern Architecture* (London: Thames and Hudson, 2000).
50. Cedric Price, 'X26: Fun Palace Project Easter Fair', sketch dated 16 February 1974, Cedric Price Archive, CCA, Montréal, Document folio DR:1995:0188:525:001:018.2.
51. Kallipoliti, 'History of Ecological Design'.
52. Herdt, *The City and the Architecture of Change.*
53. Author unknown, letter to Cedric Price, nominee for the Reynolds Memorial Award, the American Institute of Architects 1965, Cedric Price Archive, Canadian Centre for Architecture, Document folio: DR:1995:0185:275:003.
54. Price knew John McHale from his engagement in the Independent Group (1952–1956) exhibition *This is Tomorrow.*
55. Kallipoliti, 'History of Ecological Design'.
56. Herdt, *The City and the Architecture of Change.*

57. Geddes, *Cities in Evolution*.
58. Kallipoliti, 'History of Ecological Design'.
59. Lewis Mumford, 'Introduction', in Jaqueline Tyrwhitt, *Patrick Geddes in India* (London: Lund Humphries, 1947), 10.
60. Declaration of the United Nations Conference on the Human Environment, UNO 1972, https://www.ifrc.org/docs/idrl/I242EN.pdf.
61. Kallipoliti, 'History of Ecological Design'.
62. Mathews, 'An Architecture for the New Britain', 306.
63. Ibid.
64. Cedric Price, interview with Christian Kühn, Vienna 2002, *UmBAu* 20 (2003), cited in: Hardingham, *Cedric Price Works,* Volume II, 504.

Biography

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