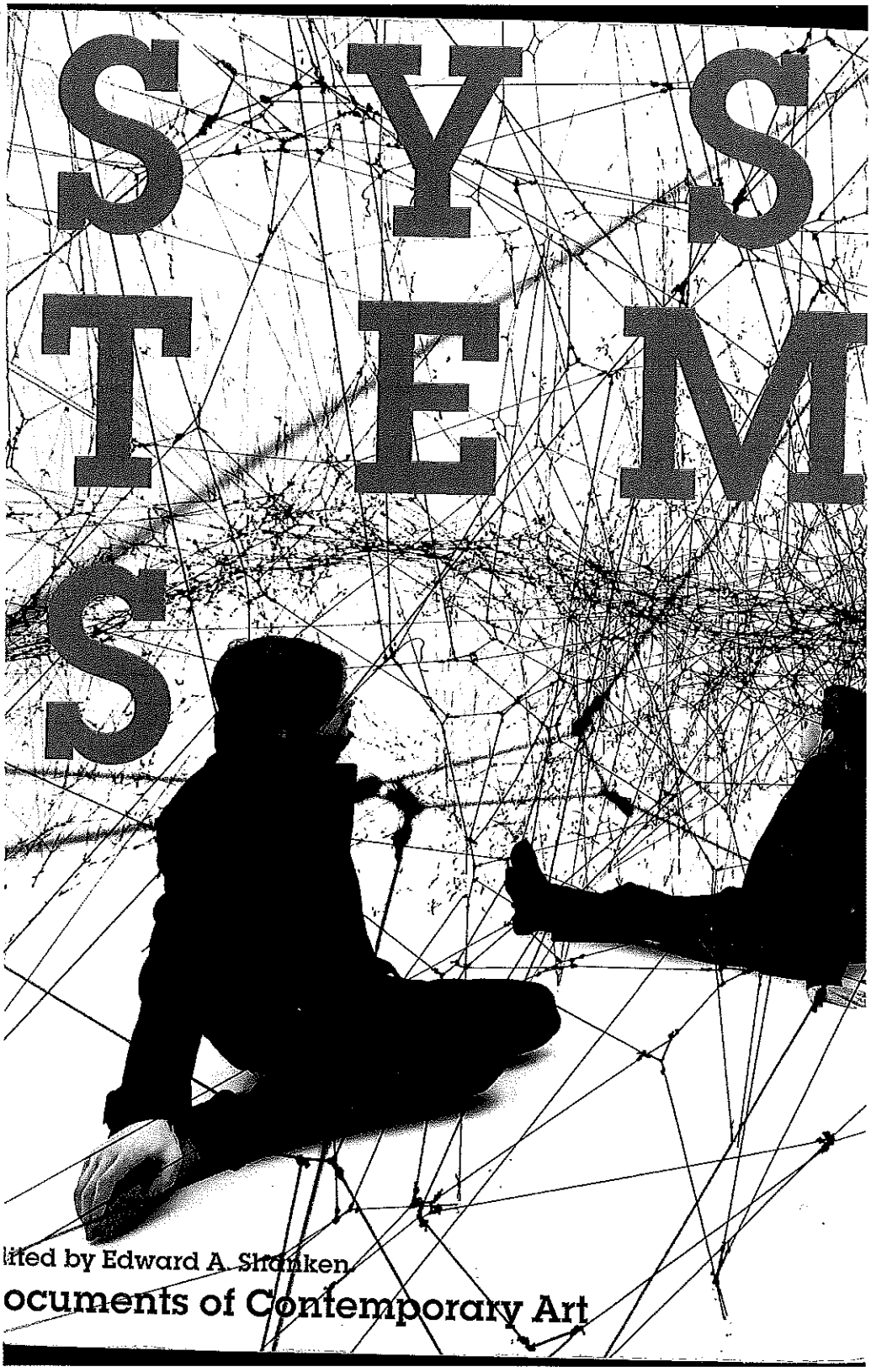

lited by Edward A. Shanken

ocuments of Contemporary Art

a new form of criticism and analysis. The theory of this mode of art will have its technical, philosophical and communications aspect bound up within a larger cybernetic framework, which Gregory Bateson has called 'ecology of mind'. This in turn will produce a reevaluation and fresh interpretation of older art forms since it can be argued that meaning has never in reality been created by a one-way dispatch, nor do new ideas of images originate in the solitary mind. Individual genius was the invention of an era, which chose to delimit and contain the subversive power of art within fixed, identifiable boundaries. The field of communications network analysis is especially relevant here, and the major shift of emphasis within this field of research, in recent years, points up the dialectic between the telematic model and the older paradigm of art discourse. [...]

Telematics has arisen from an ethos of cross-disciplinary science and is set within a cybernetic perspective of the world. Numerous writers have attempted to describe the enormous changes they see occurring in human awareness, which some see as a kind of planetary consciousness. Teilhard de Chardin imagined a noosphere, a thinking layer, enveloping the biosphere of the earth. In *The Global Brain* (1983), Peter Russell advanced the hypothesis of the emergence of a planetary brain which may put us onto 'the threshold of a completely new level of evolution, as different from consciousness as consciousness is from life and life is from matter'. He further suggests that this process will result in 'a global brain, which will result in a shift in human ego-centred awareness to a unified field of shared awareness'. [...]

Networking is a shared activity of mind and a form of behaviour which is both a dance and an embrace. It brings about a convergence of ideas from scattered sources which then, amplified, plaited or stacked, diverge out into branching pathways of meaning. This darting to and fro of ideas and images (let's call it creative data), colliding, emitting new combinations, absorbing each other, virtual, real, in a state of continual transformation, puts me in mind of Gary Zukav's description of the dance of sub-atomic particles 'which never ends and is never the same' (*Dancing Wu Li Masters: An Overview of the New Physics*, 1979).

That, I would see as the grand aspiration of networking in art, where the network, the transformations of 'creative data,' are in perpetual motion, an unending process. In this sense art itself becomes not a discrete set of entities, but rather a web of relationships between ideas and images in constant flux, to which no single authorship is attributable and whose meanings depend on the active participation of whoever enters the network. In a sense there is one wholeness, the flow of the network in which every idea is a part of every other idea, in which every participant reflects every other participant in the whole. This grand reciprocity, this symmetry of sender and receiver, is such that a mirror image is exchanged in which sender is receiver and receiver sender. The observer of the 'artwork' is a participator who, in accessing the system, transforms it. The physicists who attempt to explain the quantum view that all particles exist potentially as different combinations of other particles often cite the Buddhist parallel view of the world, expressed in the metaphor of Indra's net: 'In the heaven of Indra, there is said to be a network of pearls, so arranged that if you look at one you see all the others reflected in it. In the same way each object in the world is not merely itself but involves every other object and in fact is everything else.'[...]

Roy Ascott, extracts from 'Art and Telematics: Towards a Network Consciousness' (Bristol, 1983), in *Art + Telecommunication*, ed. Heidi Grundmann (Vancouver: The Western Front/Vienna: Blix, 1984) 25–67; reprinted in Roy Ascott, *Telematic Embrace: Visionary Theories of Art, Technology and Consciousness*, ed. Edward A. Shanken (Berkeley and Los Angeles: University of California Press, 2009) 185–200.

Gordon Pask
The Architectural Relevance of Cybernetics//1969

It is easy to argue that cybernetics is relevant to architecture in the same way that it is relevant to a host of other professions; medicine, engineering or law. PERT [Program Evaluation and Review Technique] programming, for example, is unequivocally a 'cybernetic' technique and it is commonly employed in construction scheduling. Computer-assisted design is a 'cybernetic' method and there are several instances of its application to architecture, (for example, the West Sussex County Council's planning scheme in which the designer uses a graphic display to represent the disposition of structural modules on a grid and in which the computer summarizes the cost effect consequences of a proposed layout). Of these cases the first (PERT programming) is a valuable but quite trivial application of cybernetics; the second is likely to have a far-reaching influence upon architectural design. But neither of them demonstrate more than a superficial bond between cybernetics and architecture. If we leave the matter at this level, then architects dive into a cybernetic bag of tricks and draw out those which seem to be appropriate. That is a perfectly reasonable thing to do, of course. But cybernetics and architecture really enjoy a much more intimate relationship; they share a common philosophy of architecture in the sense that Stafford Beer has shown it to be the philosophy of operational research.

The argument rests upon the idea that architects are first and foremost

system designers who have been forced, over the last 100 years or so, to take an increasing interest in the organizational (i.e. non-tangible) system properties of development, communication and control. Design problems were coped with as they cropped up, but for some time it has been evident that an underpinning and unifying theory is required. Cybernetics is a discipline that fits the bill in so far as the abstract concepts of cybernetics can be interpreted in architectural terms (and, where appropriate, identified with real architectural systems), to form a *theory* (architectural cybernetics, the cybernetic theory of architecture). [...]

A structure exists chiefly to perform certain functions, for example, to shelter its occupants or to provide them with services. At this level, a 'functional' building is contrasted with a 'decorative' building; it is an austere structure, stripped of excrescences. But the concept of functionalism can be usefully refined in a humanistic direction. The functions, after all, are performed *for* human beings or human societies. It follows that a building cannot be viewed simply in isolation. It is only meaningful as a human environment. It perpetually interacts with its inhabitants, on the one hand serving them and on the other hand controlling their behaviour. In other words, structures make sense as parts of larger systems that include human components and the architect is primarily concerned with these larger systems; *they* (not just the bricks and mortar part) are what architects design. I shall dub this notion architectural 'mutualism', meaning mutualism between structures and men or societies.

One consequence of functionalism and mutualism is a shift of emphasis towards the form (rather than the material constitution) of structures; materials and methods come into prominence quite late in the design process.

Another consequence is that architects are required to design *dynamic* rather than *static* entities. Clearly, the human part of the system is dynamic. But it is equally true (though less obvious) that the structural part must be imaged as continually regulating its human inhabitants.

Once a rudimentary version of the functional/mutualistic hypothesis has been accepted, the integrity of any single system is questionable. Most human/structural systems rely upon other systems to which they are coupled via the human components. By hypothesis, there are organizational wholes which cannot be meaningfully dissected into parts.

Holism is of several types:

a) A functionally interpreted building can only be usefully considered in the context of a city (notice that the city is also functionally interpreted and, as a result, is a dynamic entity).

b) A (functionally interpreted) structure, either a building or an entire city, can only be meaningfully conceived in the context of its temporal extension, i.e. its growth and development.

c) A (functionally interpreted) structure exists as part of an intention, i.e. as one product of a *plan*.

d) If (assumed dogma) man should be aware of his natural surroundings, then buildings should be wedded to or arise from these surroundings ([Frank Lloyd] Wright's organic thesis).

It is a corollary of a, b and c that the structure of a city is not just the carapace of society. On the contrary, its structure acts as a symbolic control programme on a par with the ritual constraints which are known to regulate the behaviour of various tribes and which render this behaviour homeostatic rather than divergent. Hence, the architect is responsible for building conventions and shaping the development of traditions (this comment simply elevates the idea that a building controls its inhabitants to a higher level of organization).

Systems, notably cities, grow and develop and, in general evolve. Clearly, this concept is contingent upon the functionalist/mutualist hypothesis (without which it is difficult to see in what sense the *system* itself *does* grow) though the dependency is often unstated. An immediate practical consequence of the evolutionary point of view is that architectural designs should have rules for evolution built into them if their growth is to be healthy rather than cancerous. [...]

Many human activities are symbolic in character. Using visual, verbal or tactile symbols, man 'talks with' his surroundings. These consist in other men, information systems such as libraries, computers or works of art and also, of course, the structures around him.

Buildings have always been classified as works of art. The novel sub-theory is that structures may be *designed* (as well as intuited) to foster a productive and pleasurable dialogue. [...] Gaudí's work, especially the Parque Guell [is] at a symbolic level one of the most cybernetic structures in existence. As you explore the piece, statements are made in terms of releasers, your exploration is guided by specially contrived feedback, and variety (surprise value) is introduced at appropriate points to make you explore.

It is interesting that Gaudí's work is often *contrasted* with functionalism. Systemically it *is* functionalism pure and simple, though it is aimed at satisfying *only* the symbolic and informational needs of man. [...]

In common with the pure architecture of the 1800s, cybernetics provides a metalanguage for critical discussion. But the cybernetic theory is more than an extension of 'pure' architecture. As we noted somewhat earlier, pure architecture was descriptive (a taxonomy of buildings and methods) and prescriptive (as in the preparation of plans) but it did little to predict or explain. In contrast, the cybernetic theory has an appreciable predictive power. For example, urban development can be modelled as self organizing system (a formal statement of 'evolutionary ideas in architecture') and in these terms it

is possible to predict the extent to which the growth of a city will be chaotic or ordered by differentiation. [...]

The cybernetic theory can also claim some explanatory power in so far as it is possible to mimic certain aspects of architectural design by artificial intelligence computer programs (provided, incidentally, that the program is able to learn *about* and *from* architects and by experimenting in the language of architects, i.e. by exploring plans, material specifications, condensed versions of clients' comments, etc.). Such programs are [...] potential aids to design, acting as intelligent extensions of the tool-like programs mentioned at the outset. Further, they offer a means for integrating the constructional system (the 'machinery of production') with the ongoing design process, since it is quite easy to embody the constraints of current technology in a special part of the simulation. However, I believe these programs are of far greater importance as evidencing out theoretical knowledge of what architecture is about. In so far as the program can be written, the cybernetic theory is explanatory.

It seems likely that rapid advances will be made in at least five areas guided by the cybernetic theory of architecture.

1. Various computer-assisted (or even computer-directed) design procedures will be developed into useful instruments.

2. Concepts in very different disciplines (notably social anthropology, psychology, sociology, ecology and economics) will be unified with the concepts of architecture to yield an adequately broad view of such entities as 'civilization', 'city' or 'educational system'.

3. There will be a proper and systematic formulation of the sense in which architecture acts as a social control (i.e. the germ of an idea, mentioned as 'holism', will be elaborated).

4. The high point of functionalism is the concept of a house as a 'machine for living in'. But the bias is towards a machine that acts as a tool serving the inhabitant. This notion will, I believe, be refined into the concept of an environment *with* which the inhabitant cooperates and *in* which he can externalize his mental processes, i.e. mutualism will be emphasized as compared with mere functionalism. [...]

5. Gaudí (intentionally or not) achieved a dialogue between his environment and its inhabitants. [...] The dialogue can be refined and extended [...] in terms of a reactive environment. If, in addition, the environment is malleable and adaptive the results can be very potent indeed. [...]

In the absence of a human inhabitant, feedback leads to stabilization with respect to certain pre-programmed invariants [...] If there is a human being in the environment, the computer, material and all, engages him in dialogue, and within quite wide limits is able to learn about and adapt to his behaviour pattern.

There is thus one sense in which the reactive environment is a *controller* and another in which it is controlled *by* its inhabitants.

In the context of a reactive and adaptive environment, architectural design takes place in several interdependent stages.

1. Specification of the purpose or goal of the system (with respect to the human inhabitants). It should be emphasized that the goal *may* be and nearly always *will* be underspecified [...] [The] aim is to provide a set of constraints that allow for certain, presumably desirable, modes of evolution.

2. Choice of the basic environmental materials.

3. Selection of the invariants which are to be programmed into the system. [...]

4. Specification of what the environment will learn about and how it will adapt.

5. Choice of a plan for adaptation and development. In case the goal of the system is *underspecified* (as in 1) the plan will chiefly consist in a number of evolutionary principles. [...]

Urban planning usually extends over time periods of years or decades and, as currently conceived, the plan is quite an inflexible specification. However, the argument just presented suggests that it need not be inflexible and that urban development could, perhaps with advantage, be governed by a process like that in the dialogue of a reactive environment (physical contact with the inhabitants giving place to an awareness of their preferences and predilections; the inflexible plan to the environmental computing machine). If so, the same design paradigm applies, since in all of the cases so far considered the primary decisions are systemic in character, i.e. they to the delineation or the modification of a control program. This universality is typical of the cybernetic approach.

One final manoeuvre will indicate the flavour of a cybernetic theory. Let us turn the design paradigm in upon itself; let us apply it to the interaction between the designer and the system he designs, rather than the interaction between the system and the people who inhabit it. The glove fits, almost perfectly in the case when the designer uses a computer as his assistant. In other words, the relation 'controller/controlled entity' is preserved when these omnibus words are replaced either by 'designer/system being designed' or by 'systemic environment/inhabitants' or by 'urban plan/city'. But notice the trick: the designer is controlling the construction of control systems, and consequently design is control *of* control, i.e. the designer does much the same job as his system, *but* he operates at a higher level in the organizational hierarchy.

Further, the design goal is nearly always underspecified and the 'controller' is no longer the authoritarian apparatus which this purely technical name commonly brings to mind. In contrast the controller is an odd mixture of catalyst, crutch, memory and arbiter. These, I believe, are the dispositions a designer should bring to bear upon his work (when he professionally plays the part of a

controller) and these are the qualities he should embed in the systems (control systems) which he designs.

Gordon Pask, extracts from 'The Architectural Relevance of Cybernetics', *Architectural Design* (September 1969) 494–6 [footnotes not included].

Mary Louise Lobsinger
The Fun Palace Project (1961–64)//2000

[...] Sometime in 1960 Joan Littlewood [a veteran of the English radical theatre scene] met and became friends with Cedric Price [...] a young architect on the London scene. [...]

Price's ideas for a technologically innovative, 'non-deterministic' architecture of planned obsolescence couched in terms of Littlewood's conceptions for alternative theatrical practice produced the quintessential anti-architectural project, the Fun Palace. Littlewood's aesthetic was characterized by an emphasis on direct communication between audience and performer. [It] stressed physical form over speech [...], employed interactive techniques [...], and adapted environmental forms such as festivals with the aim of engaging the sensory and physical participation of the audience in the action. [...] Littlewood's theatrical expertise and social mission were well met by Price's wit and architectural objective: to produce an architecture that could accommodate change. [...]

In 1963 [...] Gordon Pask [...] formed the Committee for the Fun Palace Cybernetic Theatre, which added a new twist to Littlewood's idea of direct communication. With the expertise of an unusual interdisciplinary committee [including Roy Ascott, who proposed an electronic *Pillar of Information*] now in place, the goals of the project were refocused: [...] the technological mandate moved beyond the realm of mechanical mobility into the more ephemeral mobility offered by new information media and mass communications. The discrete disciplinary interests of the three protagonists – cybernetics, transient architecture, participatory theatre and communications – merged in the objectives of the Fun Palace project: to facilitate the emergence of an ephemeral subjectivity through the theatricality of communication. [...]

Although the Fun Palace was never realized, Price achieved such notoriety [...] as to secure for himself a seminal role within debates about architecture and technology. For cutting-edge technological visionaries such as Archigram, Price was the man to watch [...]. The production of the social and the individual – both physically and virtually in real-time – is the theoretical crux of the Fun Palace. [...] The conflict between the simultaneous time of information and the disciplinary time of work (of schedules, timetables, industrial production) had to be amended for humans, to allow them to adapt to the flux and flow of the future technological world. [...]

To facilitate learning and help people live in a scientific culture, the Fun Palace would be equipped with calculating apparatuses (such as cooperative machines operated by two or three people or individual teaching machines) with the idea that these would assist people to learn cooperative behaviour and develop speed in observation and deduction. There would be closed-circuit TVs and surveillance systems by which participants could 'experience the emotional thrill and power' of watching themselves participate [in] a cybernetic learning machine. [...]

Mary Louise Lobsinger, [retitled] extracts from 'Cybernetic Theory and the Architecture of Performance', in *Anxious Modernisms*, ed. Sarah Goldhagan and Rejean Legault (Cambridge, Massachusetts: The MIT Press, 2000) 119–35.

Usman Haque
The Architectural Relevance of Gordon Pask//2007

Gordon Pask (1928–96), English scientist, designer, researcher, academic, playwright, was one of the early proponents and practitioners of cybernetics, the study of control and communication in goal-driven systems of animals and machines. Originally trained as a mining engineer, he went on to complete his doctorate in psychology. His particular contribution was a formulation of second-order cybernetics as a framework that accounts for observers, conversations and participants in cybernetic systems.

Pask was one of the exhibitors at the 'Cybernetic Serendipity' show staged at the ICA, London, in 1968, curated by Jasia Reichardt, an exhibition that became the inspiration for many future interaction designers. The interaction loops of cybernetic systems, such as Pask's *Colloquy of Mobiles* (1968), where actions lead to impacts on the environment that lead to sensing and further modification of actions, are core to the notion of a Paskian environment. He is also known for his Conversation Theory, a particularly coherent and potentially the most productive theory of interaction encompassing human-to-human, human-to-machine and