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Soylent Green: Readings in Media Art and Theory
Spring 2015
Dr. Charissa N. Terranova
University of Texas at Dallas
Arts & Humanities
Tuesday 7:00-9:45
Class Location: JO 3.908
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Art/Science/Technology: Scientists and Political Activism, 1930s UK

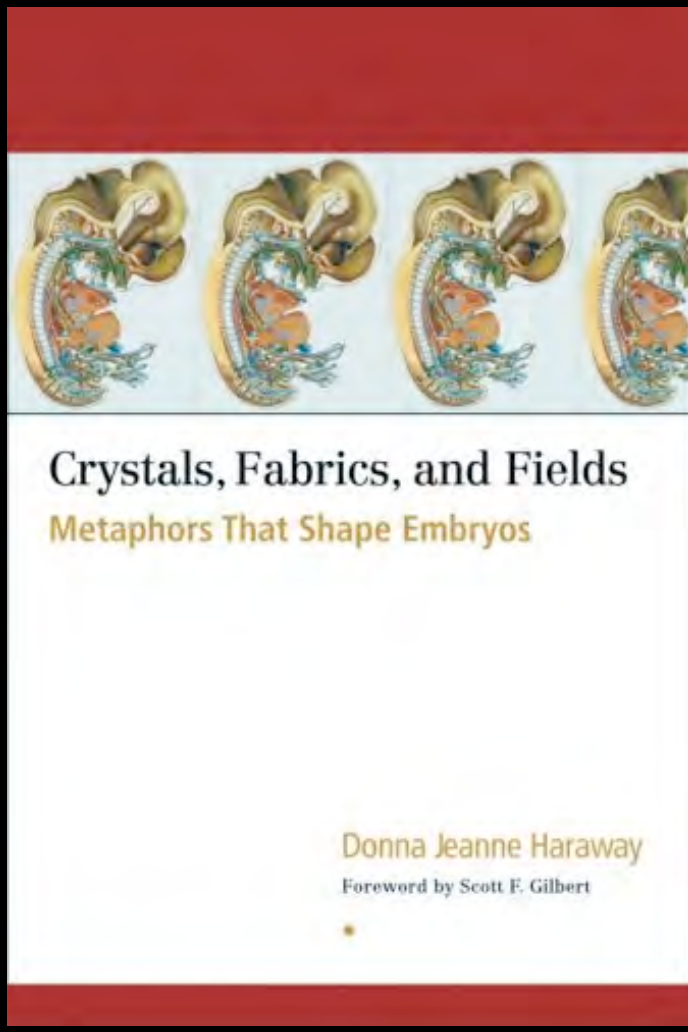
02/17/15

Who is Donna Haraway?

- Distinguished Professor Emerita, History of Consciousness Program at UC, Santa Cruz

- Haraway earned a degree in Zoology and Philosophy at the Colorado College and received the Boettcher Foundation scholarship. She lived in Paris for a year, studying philosophies of evolution on a Fulbright scholarship before completing her Ph. D. from the Biology Department of Yale in 1972. She wrote her dissertation on the functions of metaphor in shaping research in developmental biology in the twentieth century.

- *When Species Meet (Posthumanities)* (Univ. Minnesota Press, 2007)
- *The Companion Species Manifesto: Dogs, People, and Significant Otherness* (Prickly Paradigm Press, 2003)
- *Simians, Cyborgs and Women: The Reinvention of Nature* (Routledge, 1991)
- *Primate Visions: Gender, Race, and Nature in the World of Modern Science* (Routledge, 1990)
- "Cyborg Manifesto" (1985)
- *Crystals, Fabrics, and Fields: Metaphors That Shape Embryos* (1976)



"A Cyborg Manifesto: Science, Technology, and Socialist-Feminism in the Late Twentieth Century" by Donna Haraway (1985)

"The cyborg is a creature in a post-gender world; it has not truck with bisexuality, pre-oedipal symbiosis, un-alienated labor, or other seductions to organic wholeness through a final appropriation of all the powers of the parts into a higher unity. In a sense, the cyborg has no origin story in the Western sense – a 'final' irony since the cyborg is also the awful apocalyptic telos of the 'West's' escalating dominations of abstract individuation, an ultimate self untied at last from all dependency, a man in space." pp. 150-151

Cyborg - a human who has certain physiological processes aided or controlled by mechanical or electronic devices; Cybernetic organism. A living being who contains cybernetic or bionic parts to replace and / or enhance physical parts. According to Leigh Gilmore (in William Pinar), Cyborg identity becomes possible at the end of the 20th century due to the breakdown of identity structures that rendered the very notion of identity knowable and stable. The boundaries that have been fractured include the human/animal boundary, the human-animal/machine boundary, and the physical/nonphysical boundary. The cyborg is derived from science fiction. What are the repercussions of introducing this voice into various academic disciplines?

Cyborg Feminism - deconstructs binaries of control and lack of control over the body, object and subject, nature and culture. Haraway uses the metaphor of cyborg identity to expose ways that things considered natural, like human bodies, are not, but are constructed by our ideas about them.

Crystals, Fabrics, and Fields: Metaphors That Shape Embryos (1976)

- Mechanism
- Vitalism
- Theoretical Biology
- Holism
- Gestalt

Who is Karl Ludwig von Bertalanffy?

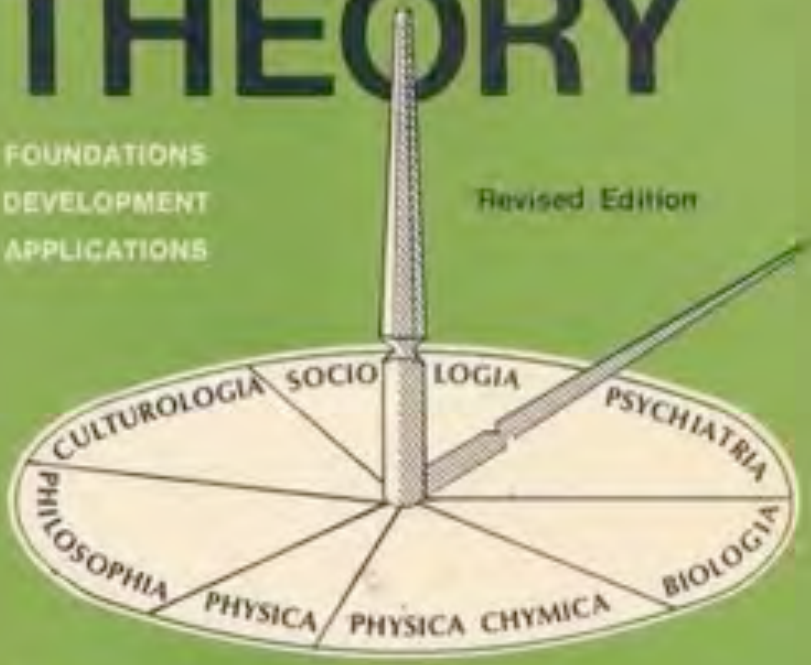
- [1901-1972]
- Austrian-born biologist
- Founder of General Systems Theory
- open systems
- cybernetics
- emphasizing holism over reductionism
- emphasizing organism over mechanism.

- 1928, *Kritische Theorie der Formbildung*, Borntraeger. In English: *Modern Theories of Development: An Introduction to Theoretical Biology*, Oxford University Press, New York: Harper, 1933
- 1968, *General System theory: Foundations, Development, Applications*, New York: George Braziller, revised edition 1976
- 1968, *The Organismic Psychology and Systems Theory*, Heinz Werner lectures, Worcester: Clark University Press.

General SYSTEM THEORY

FOUNDATIONS
DEVELOPMENT
APPLICATIONS

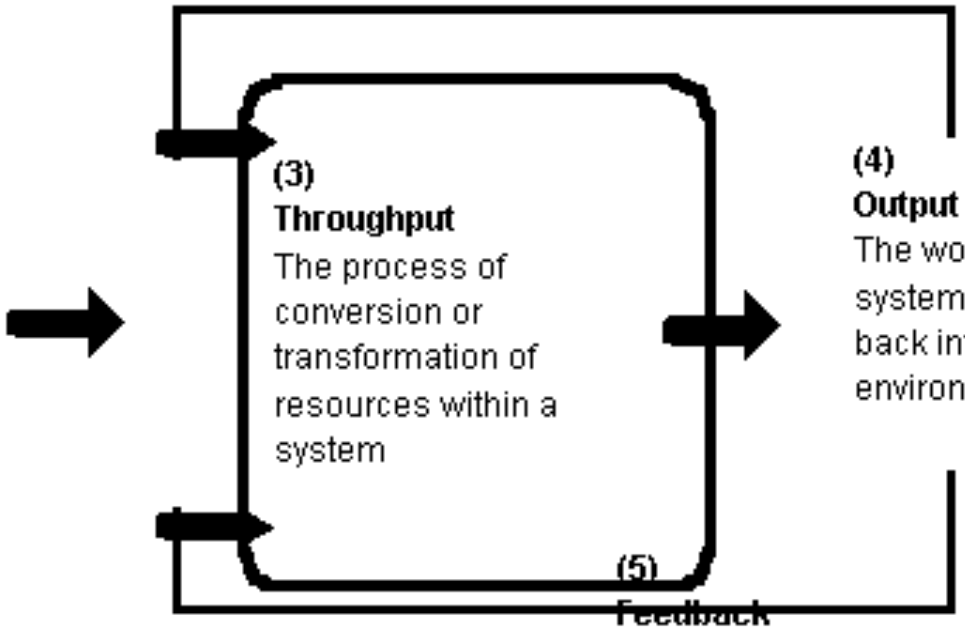
Revised Edition



by Ludwig von Bertalanffy

An authoritative introduction to one of the most important theoretical and methodological reorientations in contemporary physical, biological, behavioral and social sciences

(1)
Environment
All the elements outside the system that have the potential to affect all or part of the system.



(2)
Input
Resources are taken or received from the external environment

A continuing source of information concerning the relationship with the external environment used to make the necessary changes in order to survive and to grow.

Alfred North Whitehead (1861-1947)

- English philosopher and mathematician
- Process philosophy
- Philosophy of Organism
- Theory of perception
  - rethinking consciousness
  - Perception not limited to living, self-conscious beings
  - "prehension," from the Latin *prehensio*, meaning "to seize"
  - the perceiver actually incorporates aspects of the perceived thing into itself
  - beings or entities are made up of their perceptions and relations
  - causal efficacy/physical prehension: sense of causal relations, influences from and upon environment, unmediated by the senses
  - presentational immediacy/conceptual prehension: pure sense perception unmediated by symbolic representation or unconscious interpretation
  - appearance + causation as automatic

Theoretical Biology Club

- Joseph Needham (1900-1995) British Embryologist and Sinologist
- Dorothy Wrinch (1894-1976) Mathematician and Biochemical Theorist
- Joseph Woodger (1894-1991) Biologist and Philosopher of Biology
- J.B.S. Haldane (1892-1964) Evolutionary Biologist
- Conrad H. Waddington (1905-1975) Evolutionary Biologist and Embryologist
- Lancelot L. Whyte (1896-1972) Popular science writer
- Jacob Bronowski (1908-1974) Mathematician and Biologist

Tots and Quots

"Quot homines, tot sententiae," meaning "As many opinions as there are men."

- Solly Zuckerman (1904-1993) Zoologist and BIologist
- J. D. Bernal (1901-1971) Microbiologist and Crystallographer
- Conrad H. Waddington
- P.M.S. Blackett (1897-1974) Experimental Physicist
- J.B.S. Haldane
- Lancelot Hogben (1895-1975) Experimental Zoologist and Medical Statistician
- Joseph Needham
- James Crowther (1899-1993) Science Journalism

Epigenesis, Epigenetics, and Autopoesis

In biology, and specifically genetics, **epigenetics** is the study of heritable changes in gene activity that are *not* caused by changes in the DNA sequence.

“Once nurture seemed clearly distinct from nature. Now it appears that our diets and lifestyles can change the expression of our genes. How? By influencing a network of chemical switches within our cells collectively known as the epigenome. This new understanding may lead us to potent new medical therapies. Epigenetic cancer therapy, for one, already seems to be yielding promising results.”

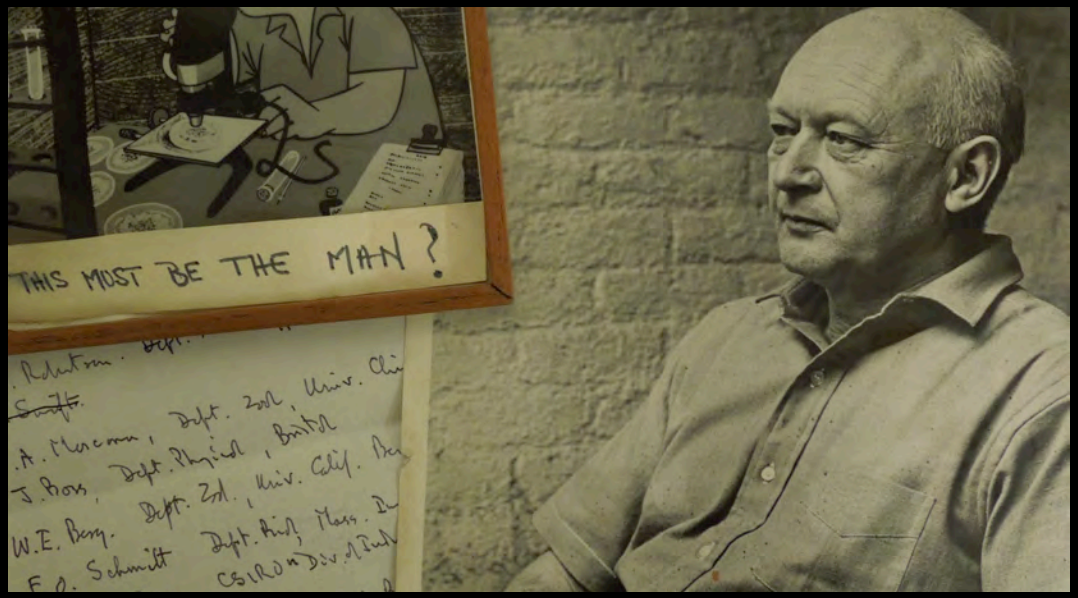
Epigenetics, Posted 07.24.07, NOVA scienceNOW, http://www.pbs.org/wgbh/nova/body/epigenetics.html

Autopoeisis - "**Autopoiesis**" (from Greek *auto-*, meaning "self", and *poiesis*, meaning "creation, production") refers to a system capable of reproducing and maintaining itself.

“An autopoietic machine is a machine organized (defined as a unity) as a network of processes of production (transformation and destruction) of components which: (i) through their interactions and transformations continuously regenerate and realize the network of processes (relations) that produced them; and (ii) constitute it (the machine) as a concrete unity in space in which they (the components) exist by specifying the topological domain of its realization as such a network.”

Autopoiesis and Cognition: the Realization of the Living, Humberto Maturana and Francisco Varela

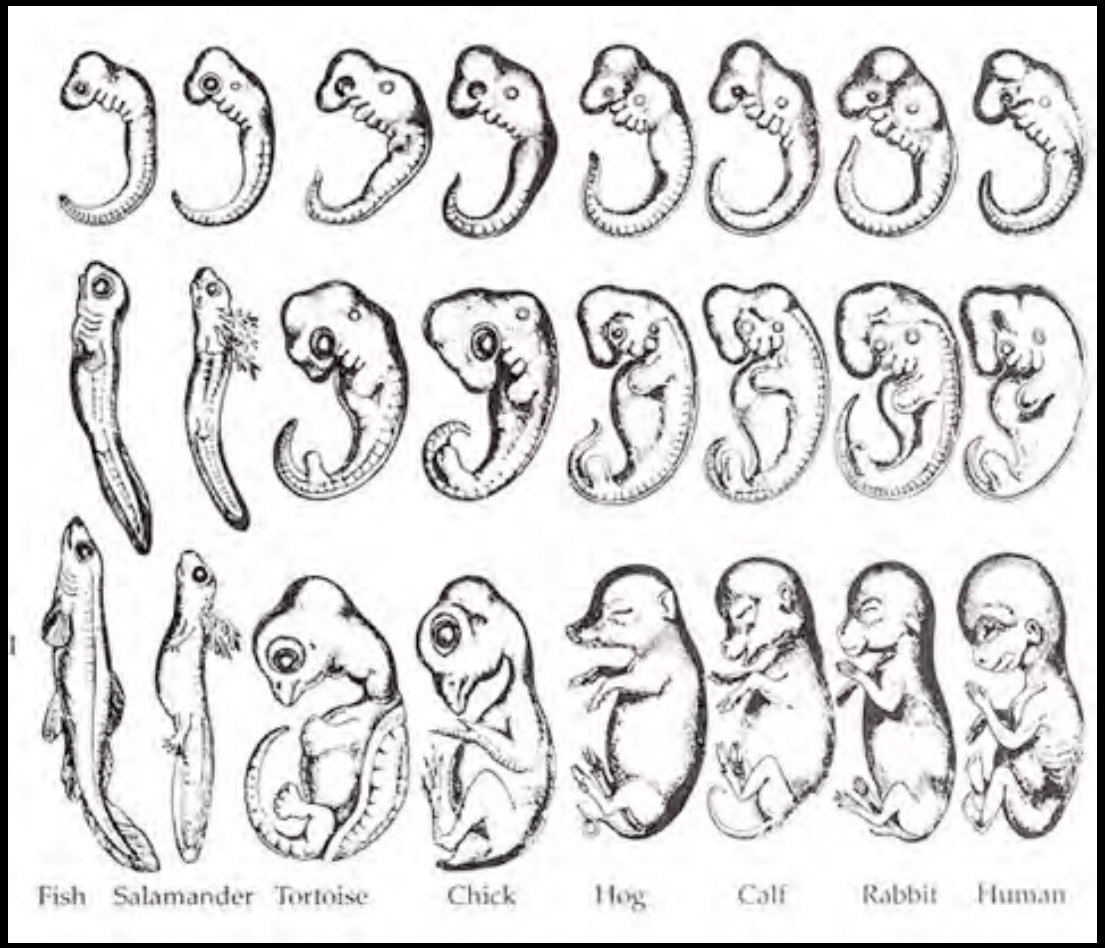
Who was Conrad Waddington?

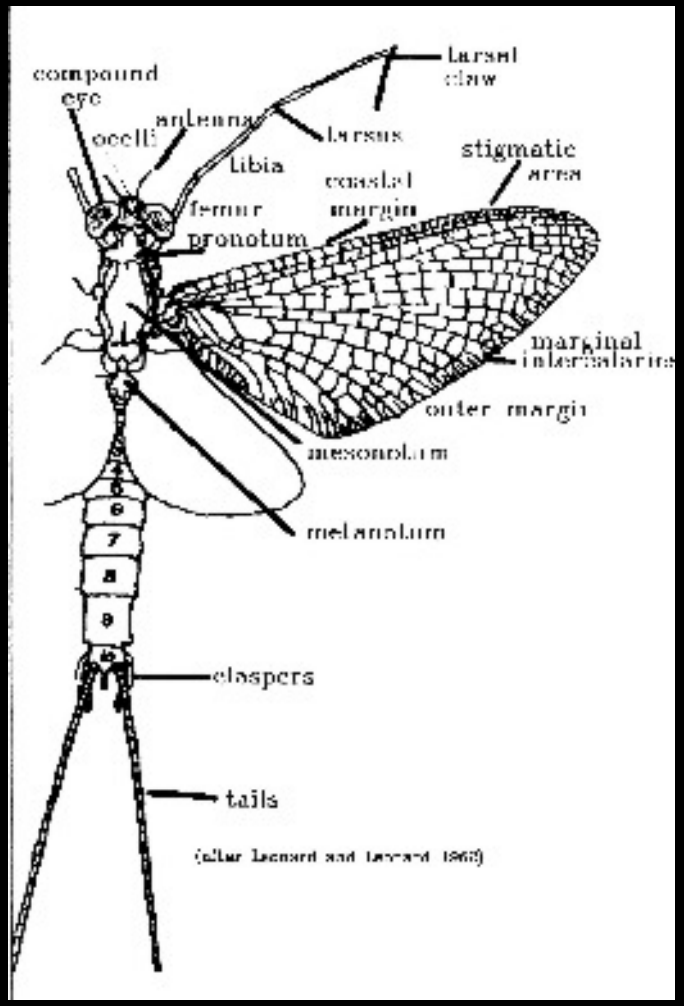


- [1905-1976]
- British developmental biologist and geneticist
- Systems Biology

  - a field of study, particularly, the study of the interactions between the components of *biological systems*, and how these interactions give rise to the function and behavior of that system (for example, the enzymes and metabolites in a metabolic pathway).
  - a paradigm, usually defined in antithesis to the so-called reductionist paradigm (biological organisation), although fully consistent with the scientific method. Indeed, the focus on the dynamics of the studied systems is the main conceptual difference between systems biology and bioinformatics.
  - a biology-based inter-disciplinary field of study that focuses on complex interactions within biological systems, using a more holistic perspective (holism instead of the more traditional reductionism) approach to biological and biomedical research.

- Interested in poetry and painting, as well as left-wing political leanings.
- In his book *The Scientific Attitude* (1941), he touched on political topics such as central planning and praised marxism as a "profound scientific philosophy".



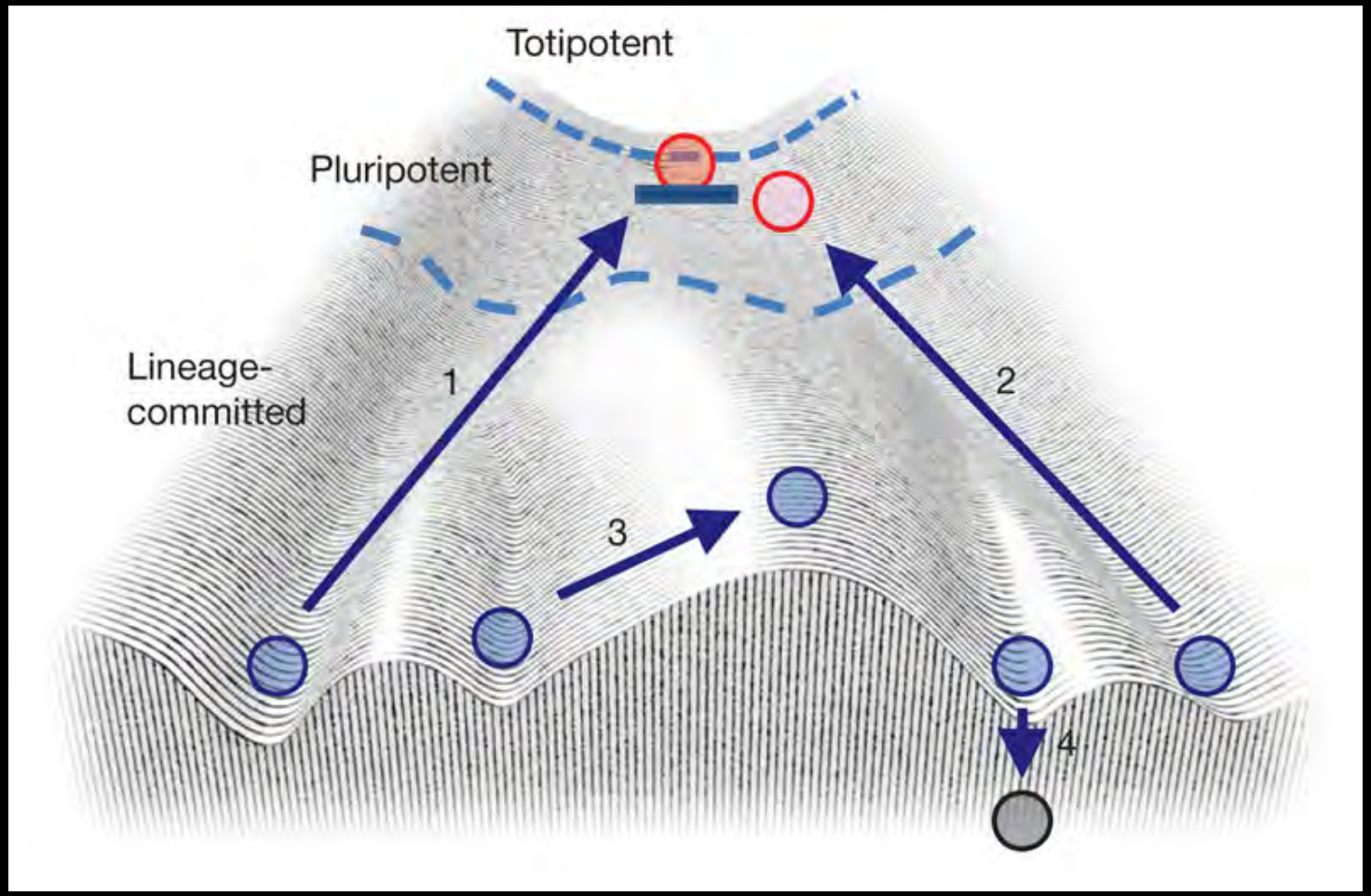


- evolutionary biology

- genetic assimilation - similar to the Lamarkian notion of evolution -- that organisms can 'force' their own evolution. It is a process whereby some environmental condition (usually an environmental stressor) causes an alteration in an organism's phenotype which that organism is then able to express in successive generations without the existence of the environmental stimuli.

- Conrad Waddington, the proposer of this notion, exposed fly pupae to excessive heat. Some of the adults in this laboratory population then displayed an unusual gap in the crossveins of their wings.

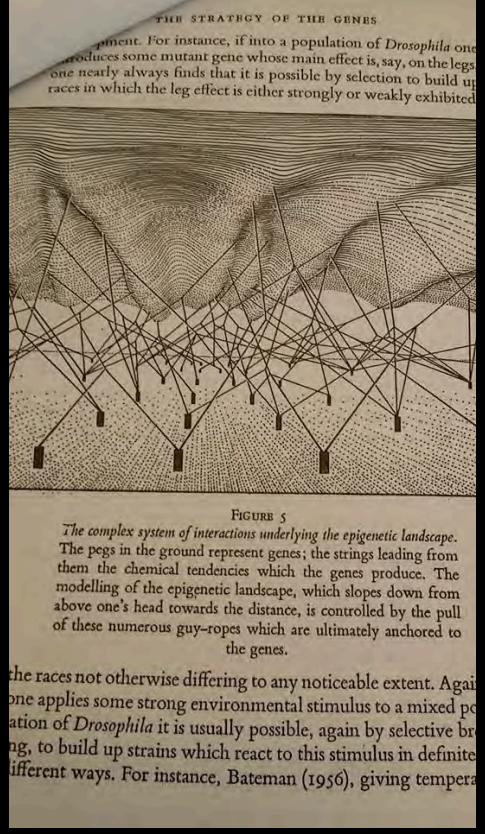
http://tomorrowstheme.blogspot.com/2011_07_01_archive.html



CREODE – “necessary path”

Creode is a neologism coined by the biologist C.H. Waddington to represent the developmental pathway followed by a cell as it grows to form part of a specialized organ. Combining the Greek roots for "necessary" and "path," the term was inspired by the property of regulation.[1] When development is disturbed by external forces, the embryo attempts to regulate its growth and differentiation by returning to its normal developmental trajectory.

Waddington explains development with the metaphor of a ball rolling down a hillside, where the hill's contours channel the ball in a particular direction. In the case of a pathway or creode which is deeply carved in the hillside, external disturbance is unlikely to prevent normal development. He notes that creodes tend to have steeper sides earlier in development, when external disturbance rarely suffices to alter the developmental trajectory.



THE STRATEGY OF THE GENES

pment. For instance, if into a population of *Drosophila* one
roduces some mutant gene whose main effect is, say, on the legs
one nearly always finds that it is possible by selection to build up
races in which the leg effect is either strongly or weakly exhibited

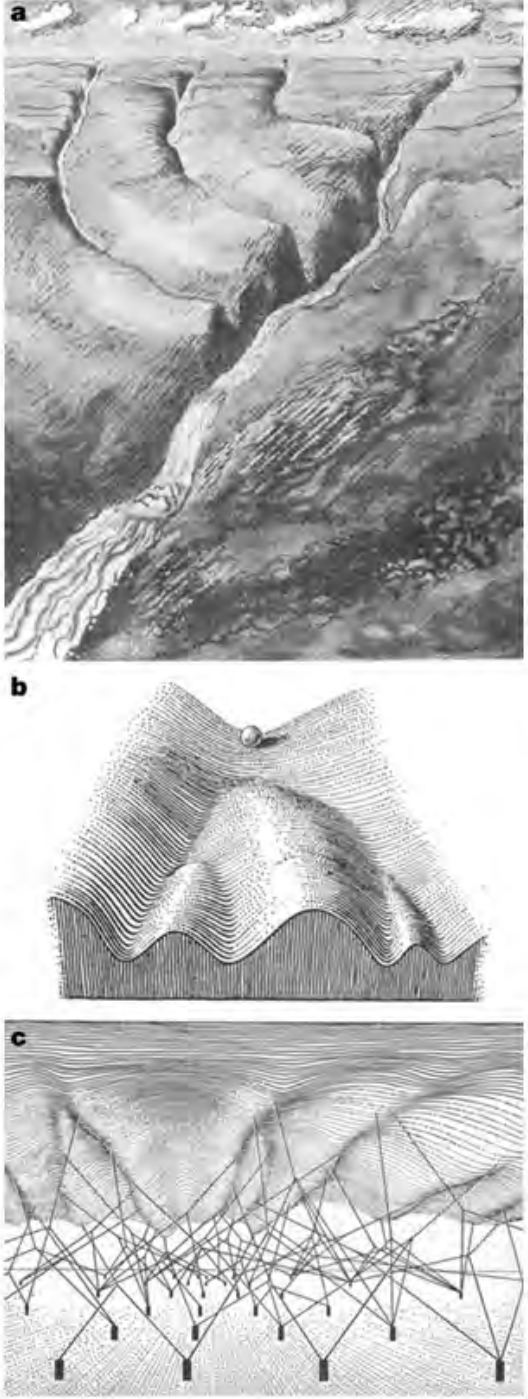
FIGURE 5

The complex system of interactions underlying the epigenetic landscape. The pegs in the ground represent genes; the strings leading from them the chemical tendencies which the genes produce. The modelling of the epigenetic landscape, which slopes down from above one's head towards the distance, is controlled by the pull of these numerous guy-ropes which are ultimately anchored to the genes.

he races not otherwise differing to any noticeable extent. Agai
one applies some strong environmental stimulus to a mixed po
ation of *Drosophila* it is usually possible, again by selective br
ng, to build up strains which react to this stimulus in definite
ifferent ways. For instance, Bateman (1956), giving tempera

EPIGENETIC LANDSCAPE

Waddington refers to the network of creodes carved into the hillside as an "epigenetic landscape," meaning the formation of the body depends on not only its genetic makeup but the different ways genes are expressed in different regions of the embryo. He expands his metaphor by describing the underside of the epigenetic landscape. Here we see that the "landscape" is really more like a giant sheet that would blow away except that a series of tension-bearing cables holds it down. The pegs that connect the cables to the ground are the genes. The cables themselves are the epigenetic factors that influence gene expression in various regions of the embryo. The depth and direction of the channels is thus determined by a combination of genetic makeup and the epigenetic feedback loops by which genes are regulated.



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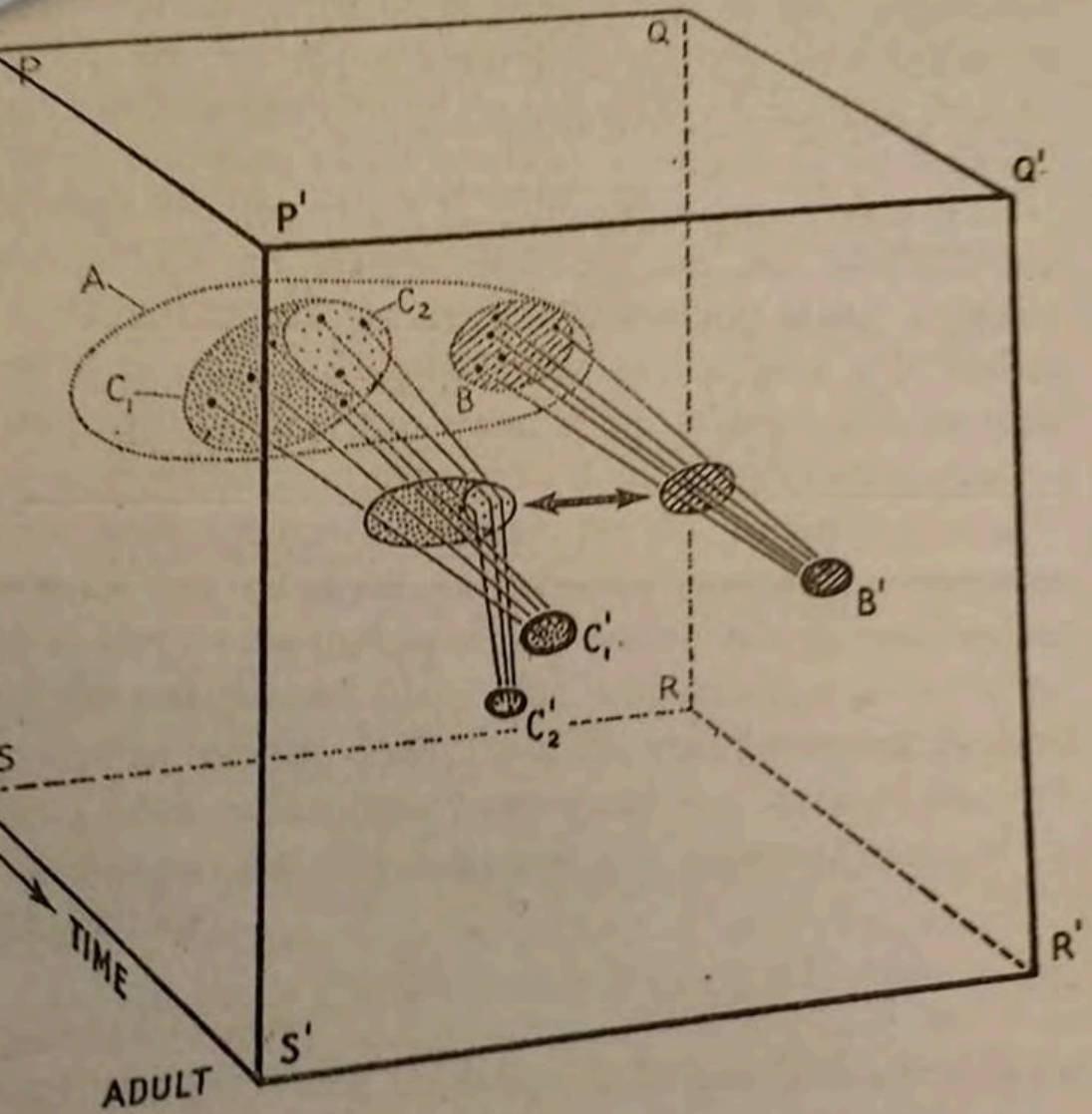

FIGURE 3

phase–space diagram of development. The time axis runs perpendi–
ılar to the paper, from the plane *PQRS* at the time of fertilisation

extent. Consider a more or less flat, or rather undulating,
e, which is tilted so that points representing later states are
than those representing earlier ones (Fig. 4). Then if some-

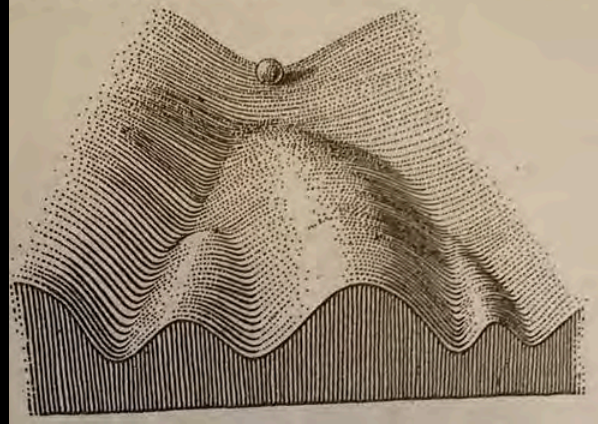

FIGURE 4

Part of an Epigenetic Landscape. The path followed by the ball, as it rolls down towards the spectator, corresponds to the developmental history of a particular part of the egg. There is first an alternative, towards the right or the left. Along the former path, a second alternative is offered; along the path to the left, the main channel continues leftwards, but there is an alternative path which, however, can only be reached over a threshold.

PHASE SPACE
EPIGENETIC LANDSCAPE

Phase space is a multidimensional space of genetic development. Here all possible states of a system are represented, with each possible state of the system corresponding to one unique point in the phase space.

homeostasis/homeorhesis

- homeostasis - is the property of a system in which variables are regulated so that internal conditions remain stable and relatively constant.
  - A **homeostasis** operates by switching heaters or air-conditioners on and off in response to the output of a temperature sensor.
  - Cruise control adjusts a car's throttle in response to changes in speed.

- homeorhesis - a concept encompassing dynamical systems which return to a trajectory, as opposed to systems which return to a particular state, which is termed homeostasis.
- "Whereas the process of keeping something at a stable, or stationary value is called homeostasis, ensuring the continuation of a given type of change it is called homeorhesis." C.H. Waddington
- The word itself is a little-used term of art in biology, where it describes the tendency of developing or changing organisms to continue development or change towards a given state, even if disturbed in development. The term was first coined by C.H. Waddington, on or before 1940, along with the related term chreod, meaning "necessary path", which is the trajectory to which the system tends to return.
- [GAIA HYPOTHESIS]
- In ecology the concept is important as an element of the Gaia hypothesis, where the system under consideration is the ecological balance of different forms of life on the planet. It was Lynn Margulis, the coauthor of Gaia hypothesis, who wrote in particular that only homeorhetic and not homeostatic balances are involved in the theory. That is, the composition of Earth's atmosphere, hydrosphere, and lithosphere are regulated around "set points" as in homeostasis, but those set points change with time

Gyorgy Kepes (1906-2001)

Kepes, ed., *Vision + Values Series* (1965-66; 1972)

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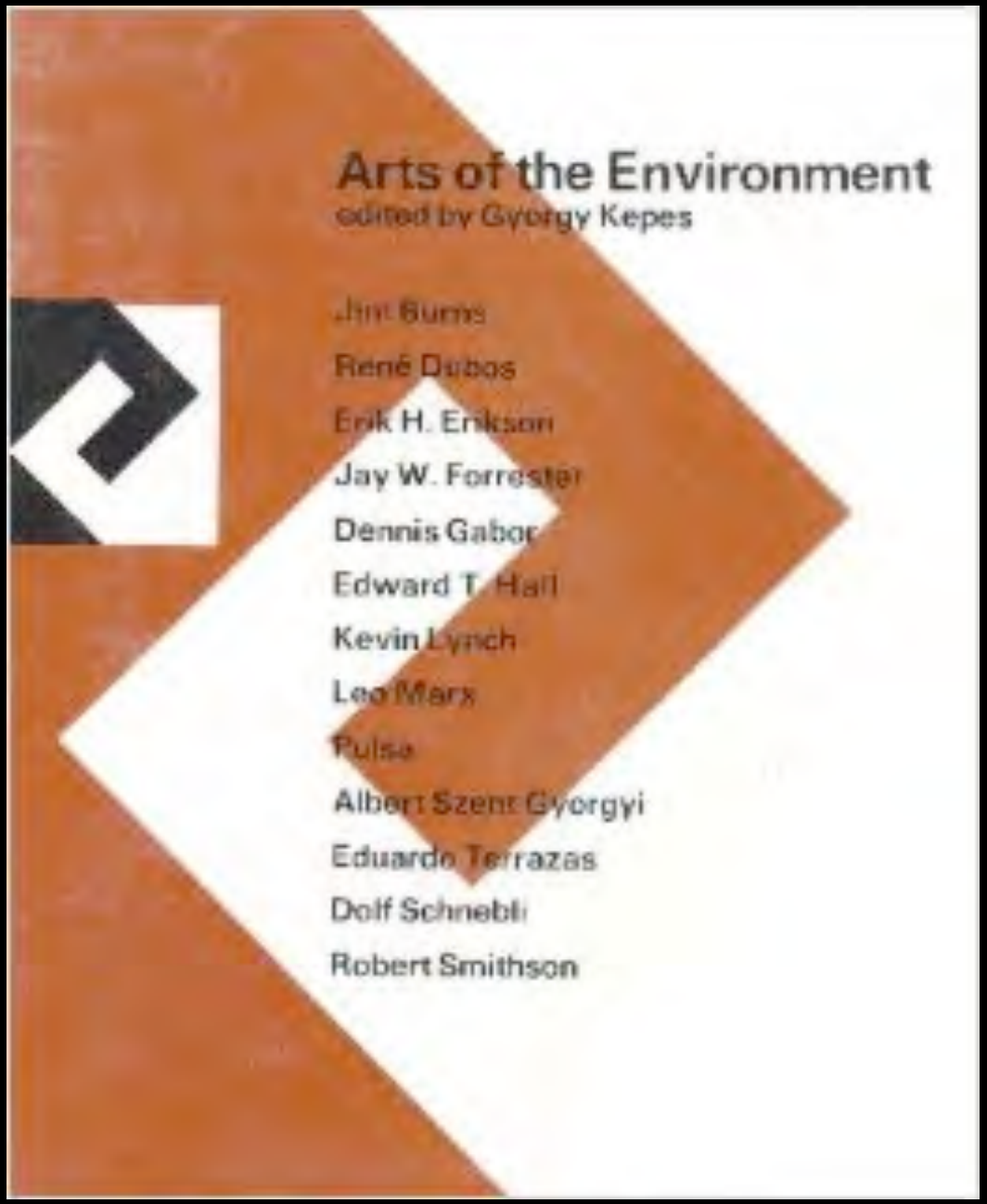
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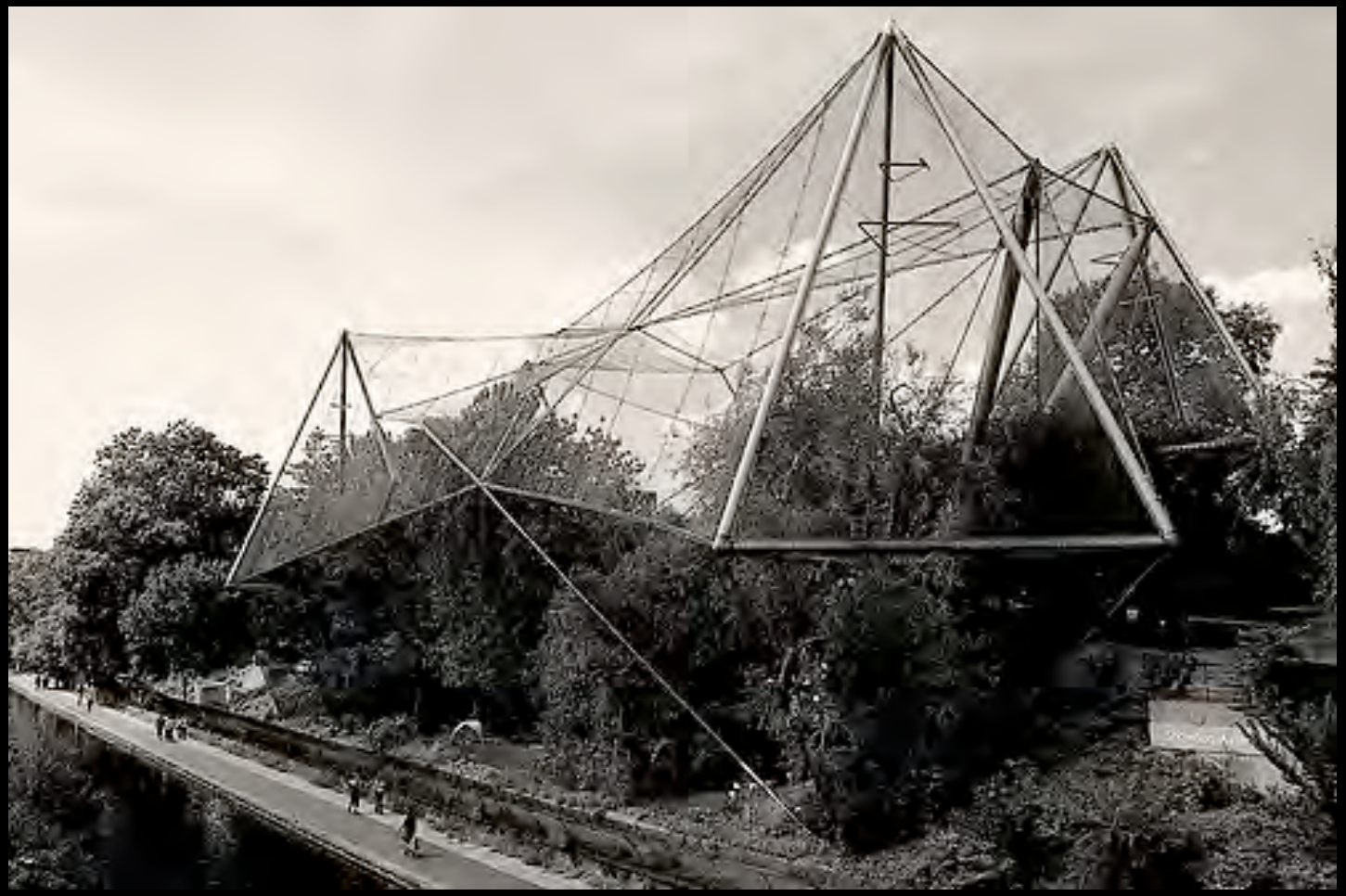
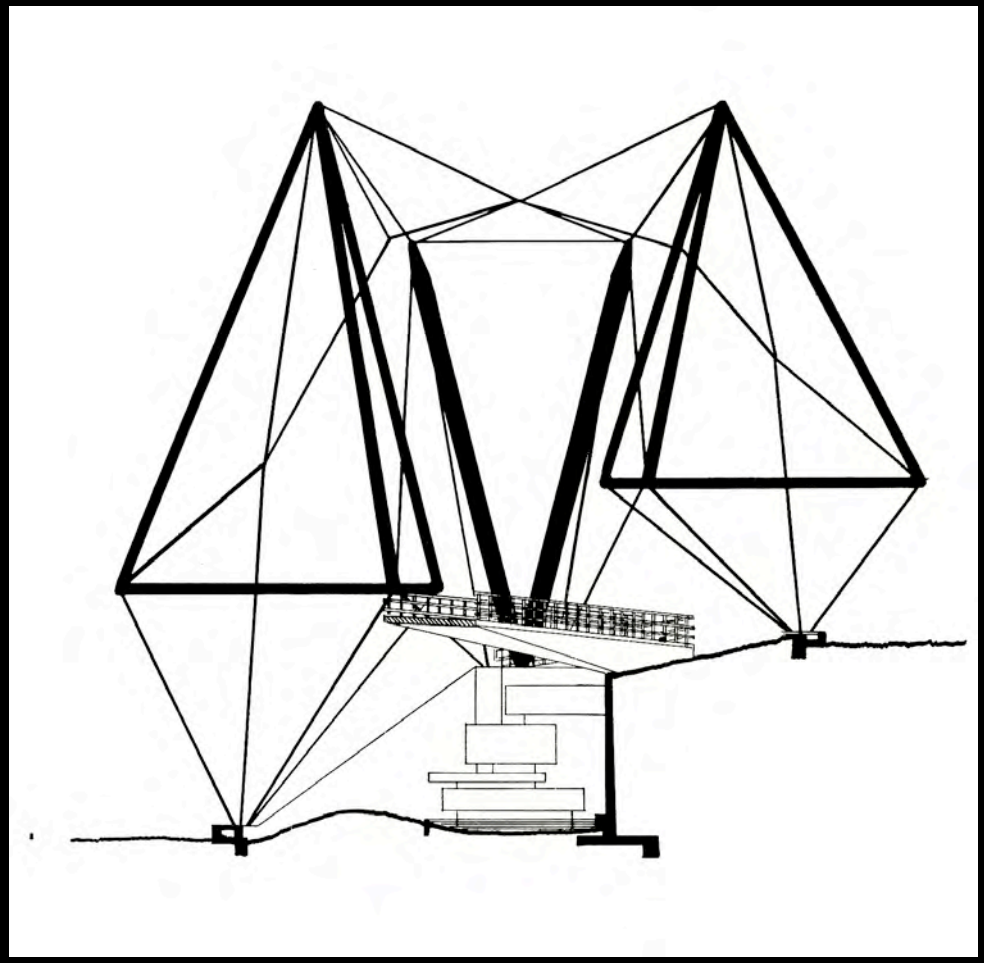
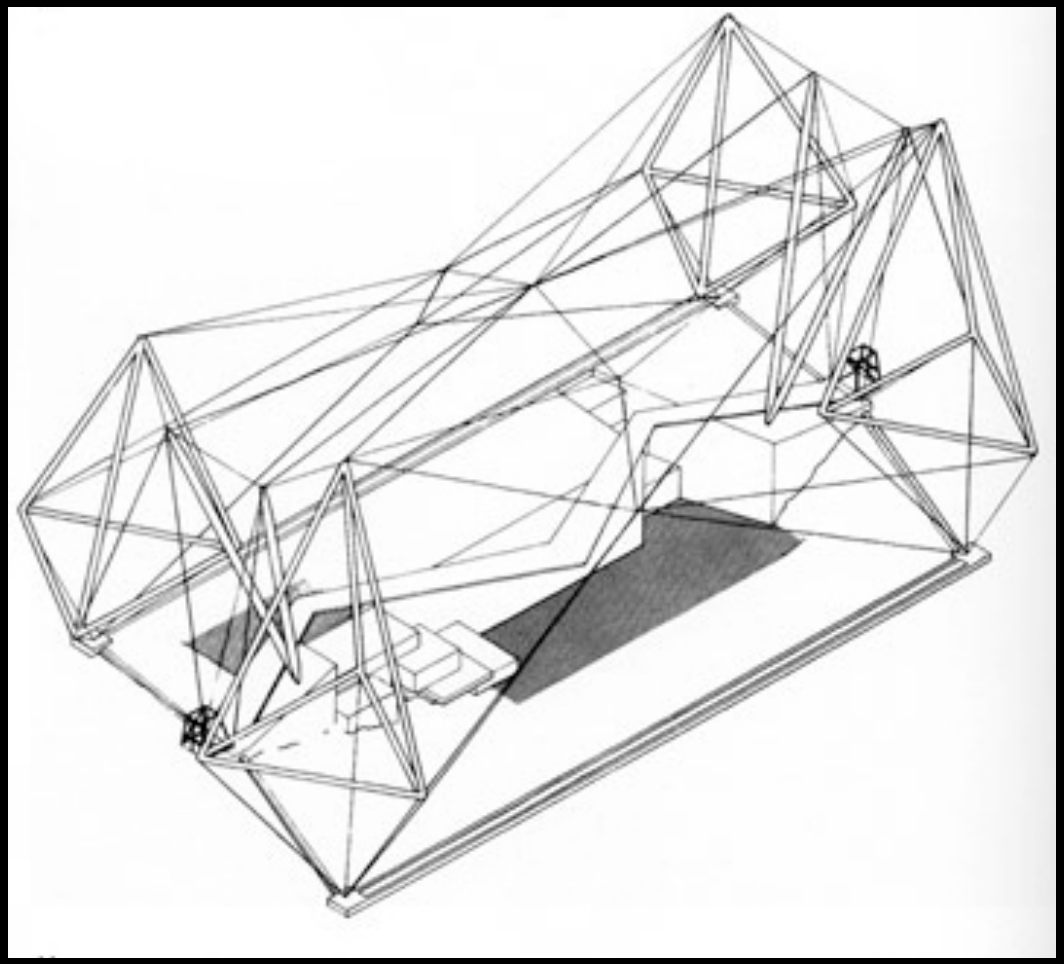
Morphogenetic Metaphors in Architecture

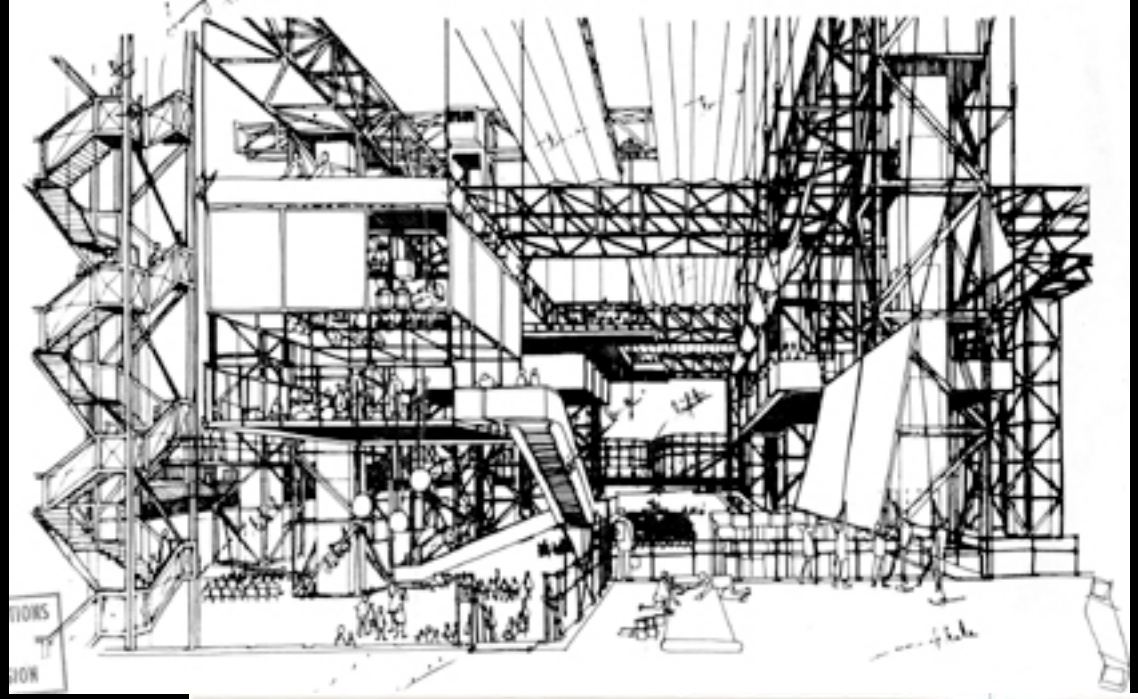


Cedric Price (1934-2003), Snowdon Aviary at the London Zoo, 1961
ARCHIGRAM
All buildings according to him should allow for obsolescence and complete change of use.



The aviary was designed for a community of birds and his idea was that once the community was
established it would be possible to remove the netting . The skin was a temporary feature: it only needed to be there long enough for the birds to begin to feel at home and after that they would not leave anyway.
http://iqbalaalam.wordpress.com/2011/12/05/cedric-price-influential-architect-and-theoritician/



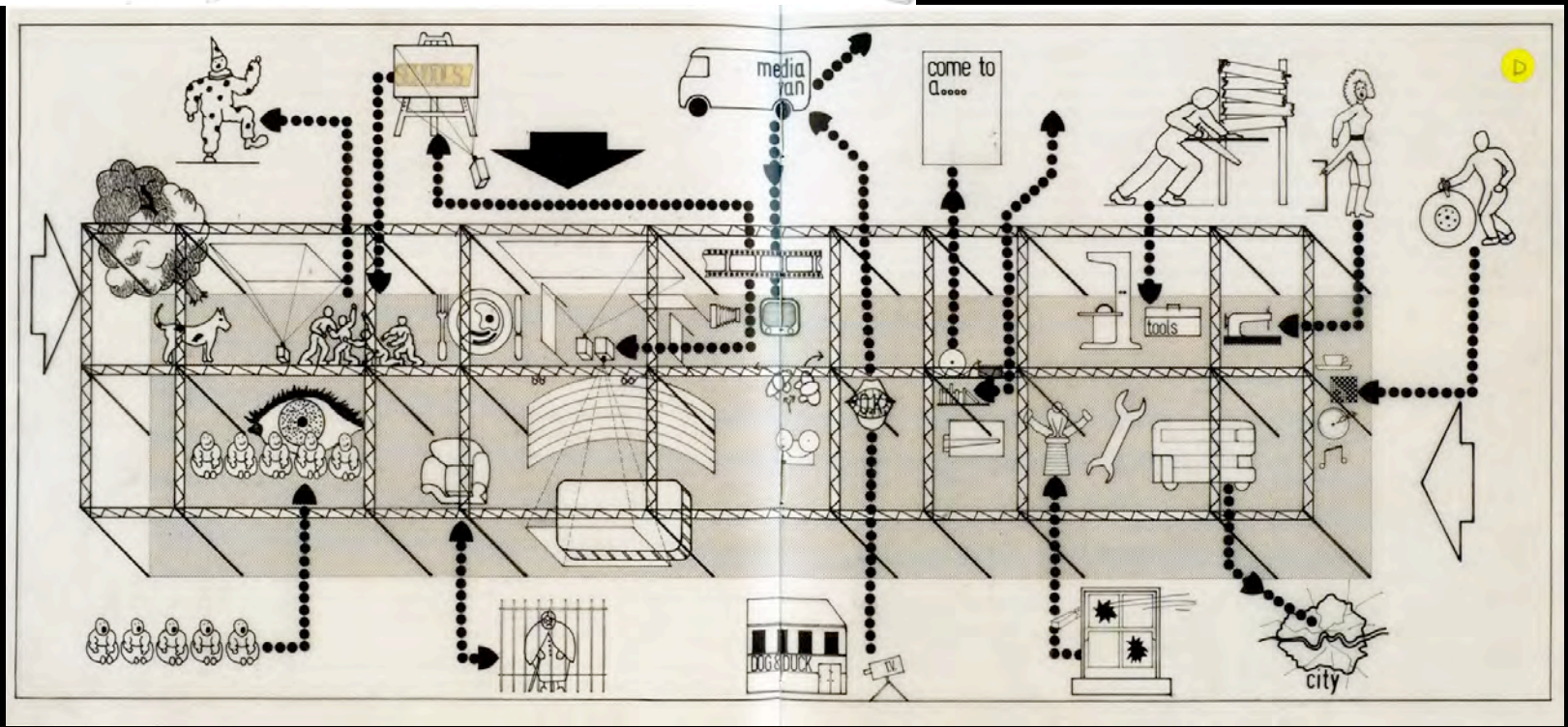


Cedric Price, Fun Palace, 1961

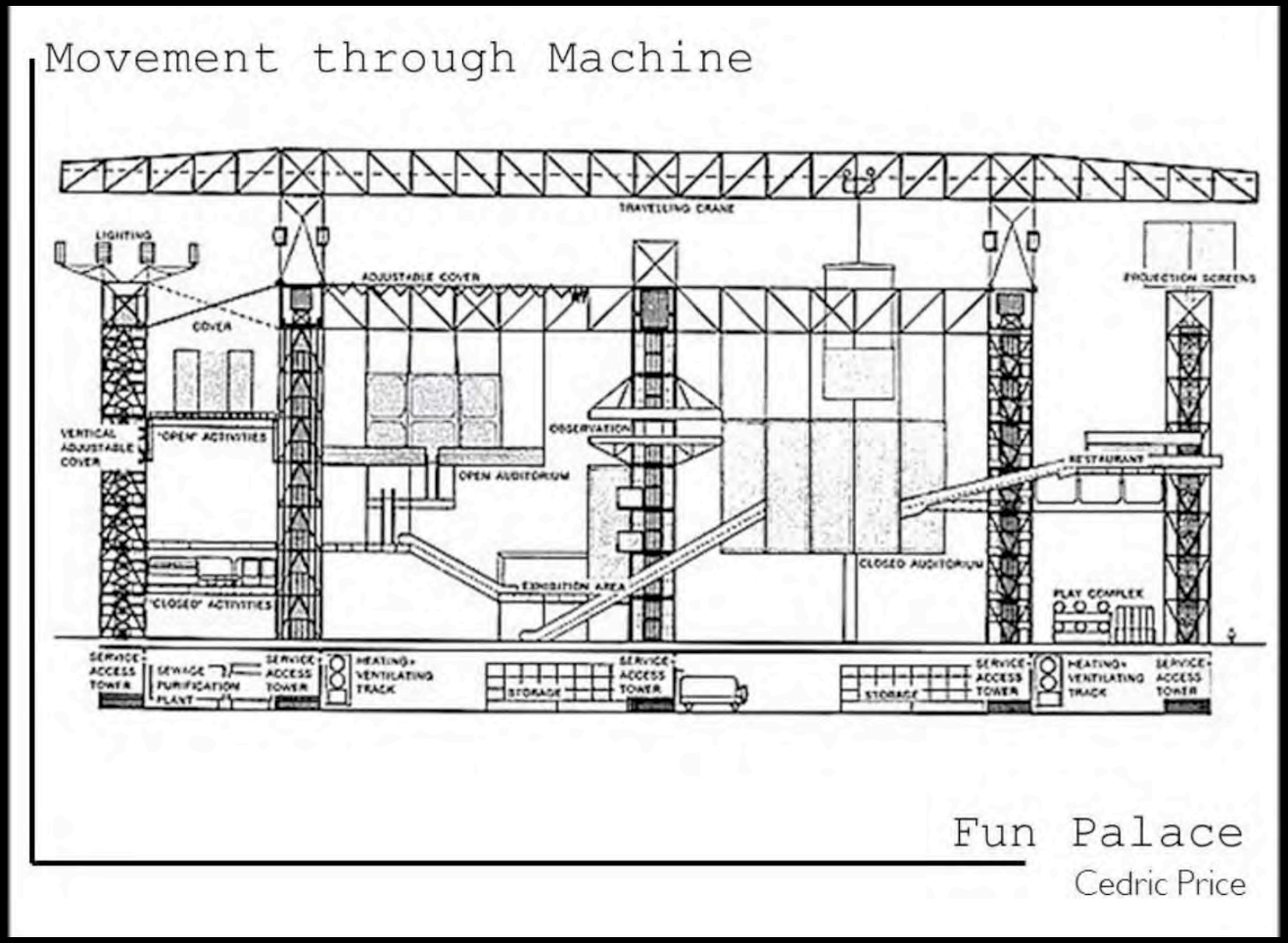
On the one hand, Fun Palace was inspired by the egalitarian philosophy of eighteenth century English pleasure grounds, such as Vauxhall and Ranelagh, with their sprawling spaces for strolling, amusement, and gossip. On the other hand, Price's unrealised project was up-to-the-minute, interpreting current Cybernetic theories, avant-garde theatrical principles, cutting edge technology, and a free-spirited, Monty Pythonesque sense of fun. The ultimate goal was a building capable of change in response to the wishes of users.

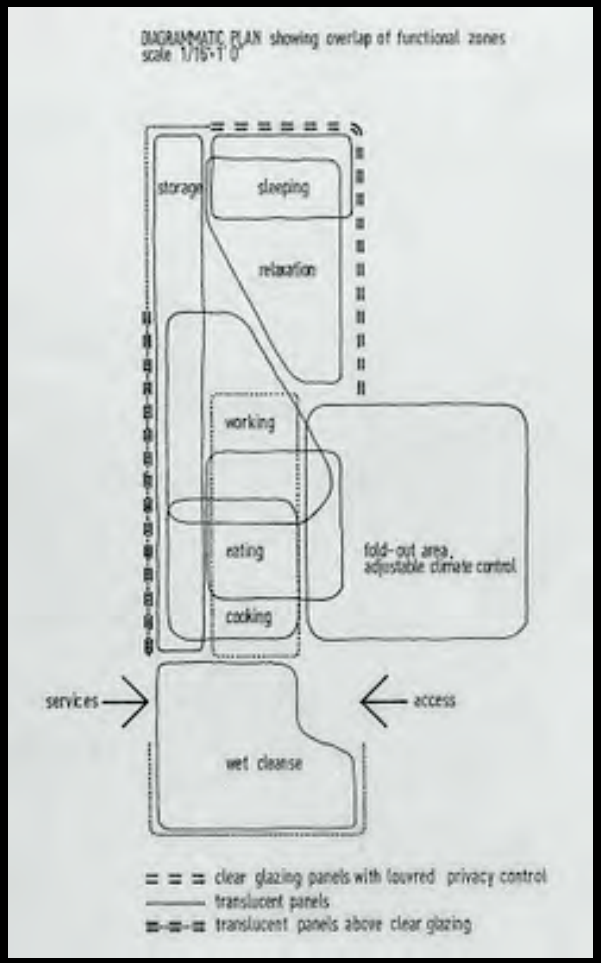
The project also involved a Fun Palace Cybernetics Committee, led by Gordon Pask (1928 – 1996). One of the leading figures in the study and development of Cybernetics, which was concerned with information, feedback, identity, and purpose, Pask examined such issues as how the human organism learns from its environment and relates to others through language.

http://www.cca.qc.ca/en/collection/283-cedric-price-fun-palace



The only fixed element within the Fun Palace was to be the structural grid of steel lattice columns and beams. All other programmatic elements – hanging theatres, activity spaces, cinema screens and speakers – were to be movable or composed of prefabricated modular units that could be quickly assembled and taken apart as needed.
http://www.cca.qc.ca/en/collection/283-cedric-price-fun-palace

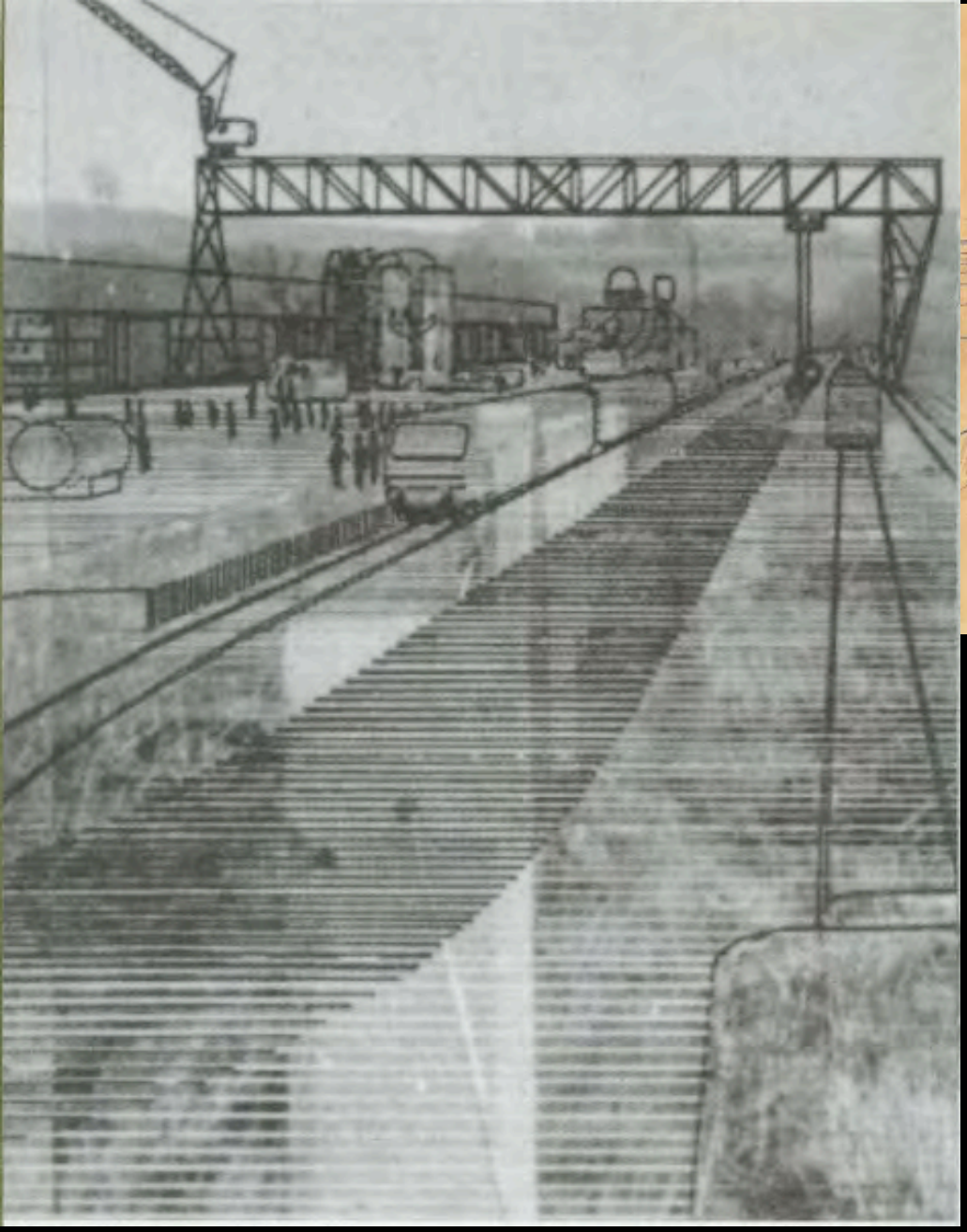


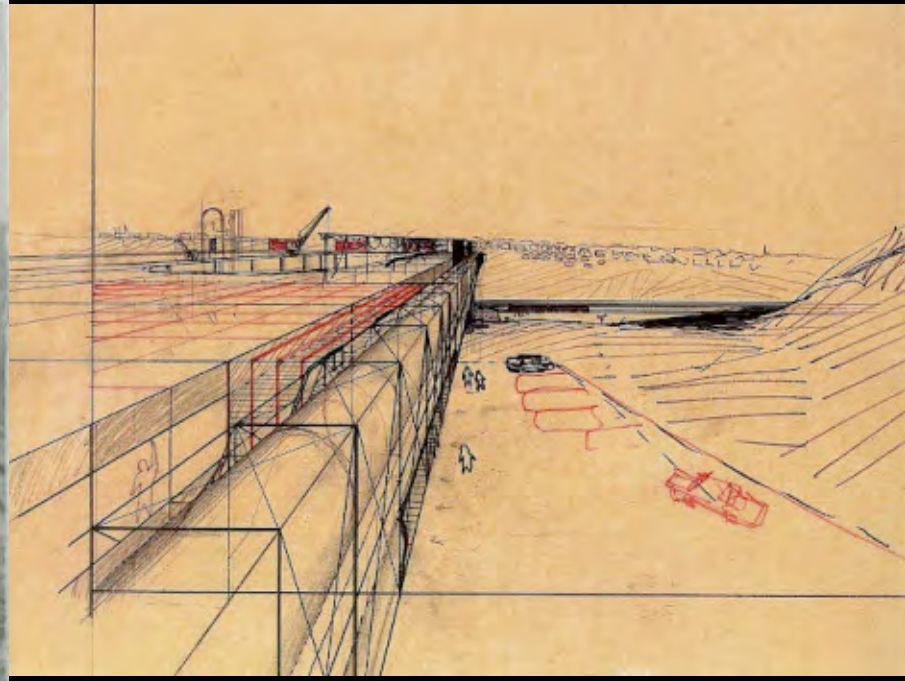


Cedric Price's unrealized project called Potteries Thinkbelt which envisioned the dilapidated industrial infrastructure of the North Staffordshire Potteries and turn it into a new kind of High-Tech University. Potteries Thinkbelt emphasis Price's "preference for dismantling architecture and making it disappear into unconventional systems."

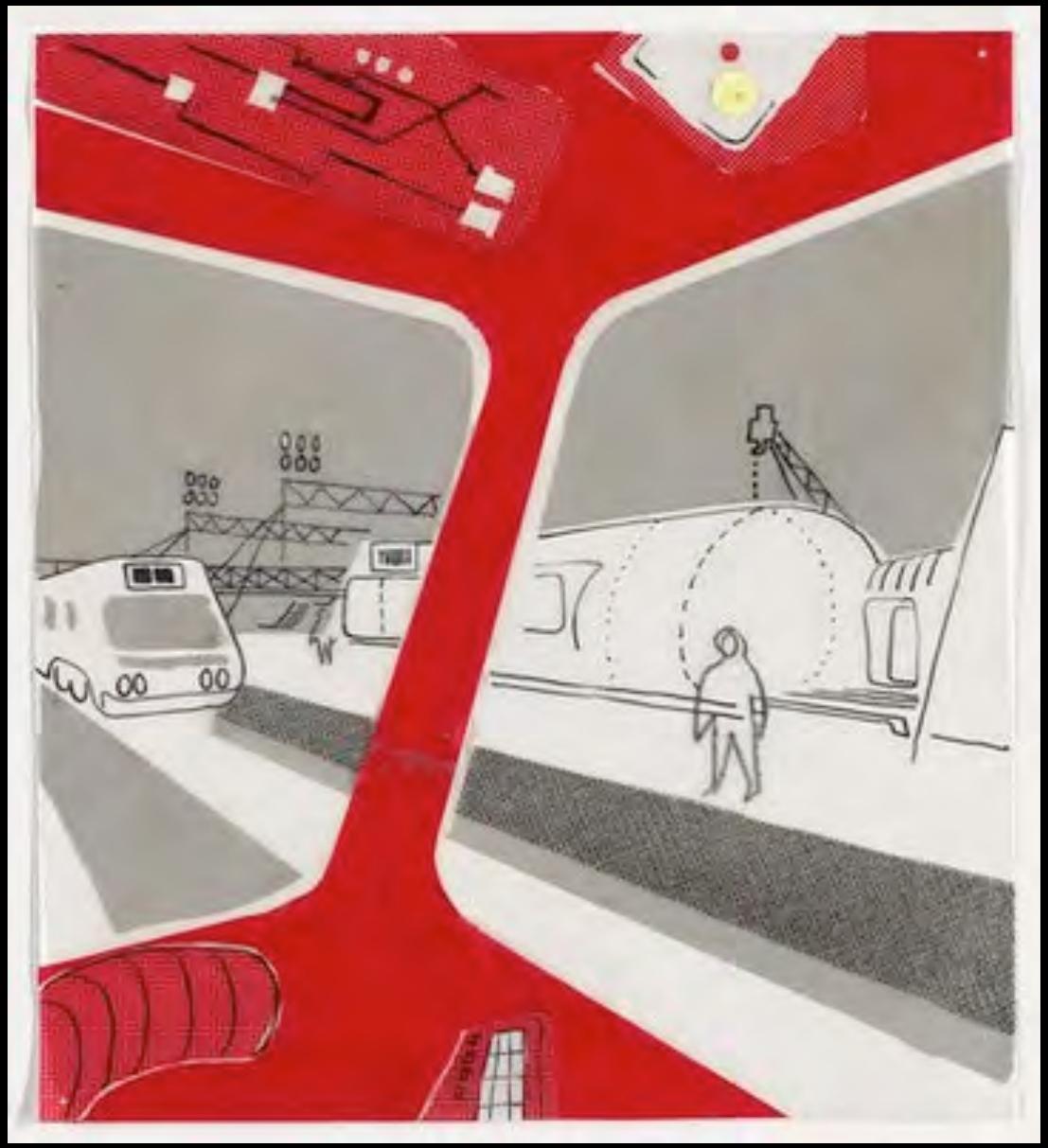
Before WWII, North Staffordshire Potteries was the centre of the English ceramic industry for more than 250 years and was known for its cutting edge technological developments. But after the war and with an international shift from industrial production to a technological and scientific production, the Potteries languished unable to modify to the new market. Cedric Price grew up in the Potteries and wanted to see the Potteries not only recover but regain its previous status as an innovative progressive community by branding the Potteries as the new scientific and innovation hub. The PtB was to be an alternative to conventional higher educational institutions that was primarily devoted to science and technology. The project addressed the many concerns that Price felt were the main issues with the ailing community such as the unemployment, vast areas of unused, unstable land, and a national need for scientists and engineers. The structure of PtB was unconventional and radical and did not conform to what was considered architecture at the time and could not be supported by the ministry of education.
http://citymovement.wordpress.com/2012/08/03/cedric-prices-potteries-thinkbelt/

Cedric Price, Potteries ThinkBelt University, 1963



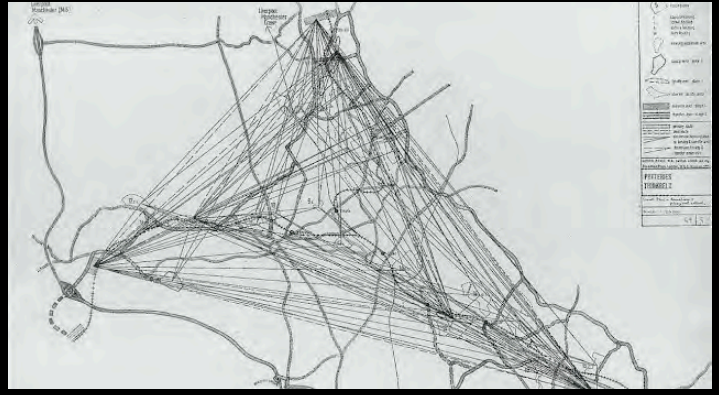


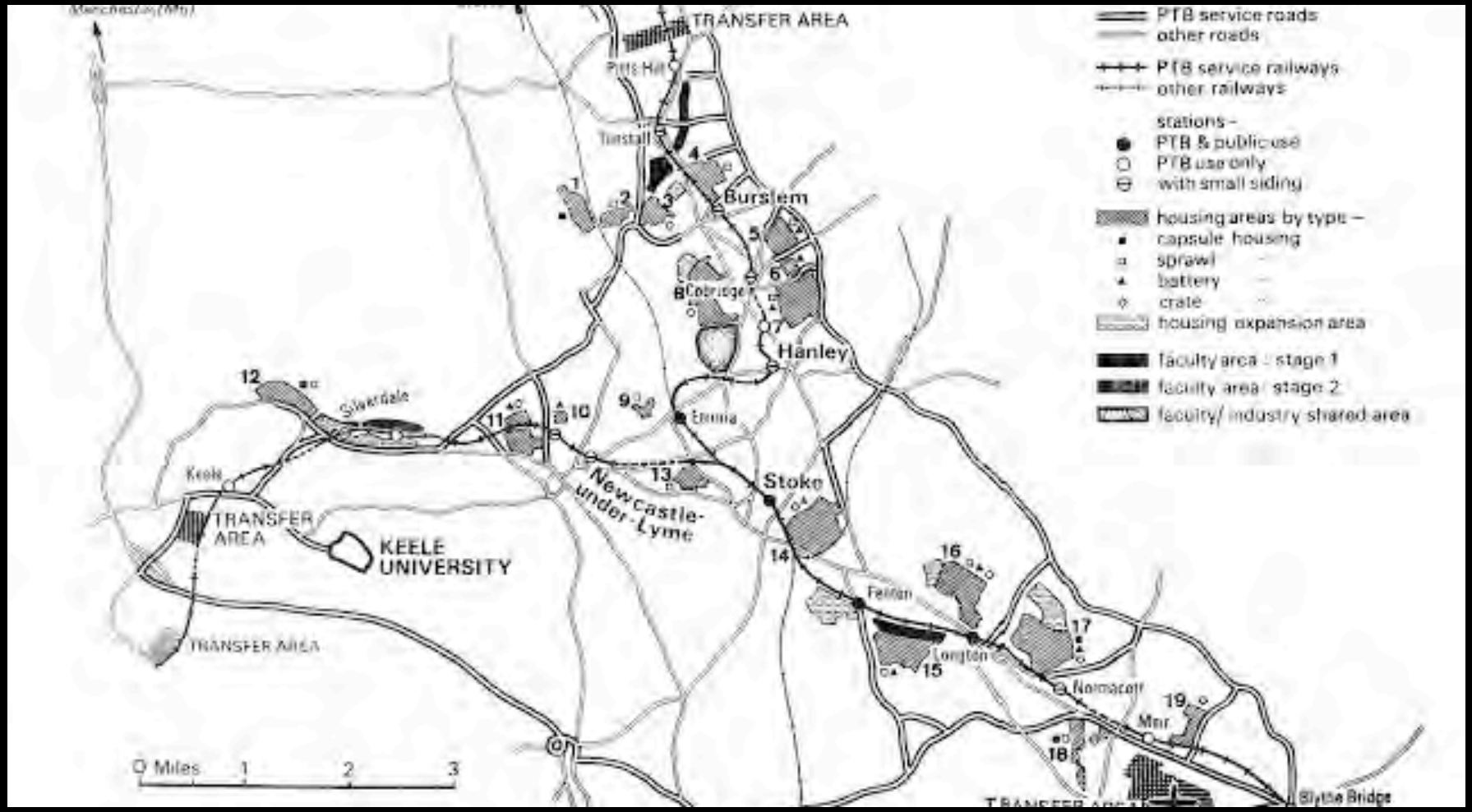

chitectural design
Price 5s.



He conceived of his Potteries Thinkbelt (1963) not as a building but as a network of flexible and flexing facilities linked by, and taking full advantage of, the underused railway system of surplus lines, sidings and derelict land, at a chosen site in the 'Potteries' in his native Staffordshire. Price's use of a railway system was intended to exploit existing resources and to assert the significance of communications but also to polemicize against thoughtless conventionality. The railway system monopolized the attention of critics, some of whom missed the Potteries Thinkbelt's larger purpose of demonstrating higher education as an enabler, a social generator and an economic revitalizer in a depressed area.

http://www.moma.org/collection/artist.php?artist_id=7986




TRANSFER AREA
Tunstall
Burslem
Cobridge
Hanley
Silverdale
Keele
TRANSFER AREA
KEELE UNIVERSITY
TRANSFER AREA
Newcastle-under-Lyme
Etruria
Stoke
Fenton
Longton
Normacot
Meir
Blythe Bridge
0 Miles 1 2 3
PTB service roads
other roads
PTB service railways
other railways
stations –
PTB & publicuse
PTB use only
with small siding
housing areas by type –
capsule housing
sprawl
battery
crate
housing expansion area
faculty area : stage 1
faculty area : stage 2
faculty/ industry shared area

05-11-2012
Yasuaki Onish
Reverse of Volume RG

Writer Sanford Kwinter famously appropriated Conrad Waddington's "Epigenetic Landscape" as a topological model with which to envision a new conception of formmaking, whereby matter is intrinsically latent with tendencies that "condition" its morphological evolution. Anticipating the formal free-for-all that would follow in the first decade of the new millennium, Kwinter warned against using the "form" of the epigenetic landscape (as drawn by Waddington or any other iteration) for analogical purposes, but I'm about to do just that. For his "Reverse of Volume RG" installation, Japanese artist Yasuaki Onishi has suspended a mold of "nothing", in reality, a plastic sheet held in place by strands of black hot glue string from the ceiling of the Rice Gallery in Houston. Whereas Onishi describes the piece as "casting the invisible", the resultant form approximates the billowing and folding field of Waddington's model.