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FLOWING KNOWLEDGE

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FLOWING KNOWLEDGE

R.E.D.S. CLOUD IS AN INTERNATIONAL NETWORK OF UNIVERSITIES THAT SINCE 2013 HAS BEEN ORGANIZING CONFERENCES FOR THE PROMOTION AND IMPLEMENTATION OF LANDSCAPE AND ECOLOGICAL URBANISM WITHIN ACADEMIA.

THE PRESENT VOLUME IS MAINLY A COLLECTION OF ESSAYS SUBMITTED BY MORE THAN SIXTY AUTHORS WHO RESPONDED TO THE CALL FOR PAPERS FOR THE THIRD R.E.D.S. CONFERENCE "FLOWING KNOWLEDGE". R.E.D.S. CLOUD AND THIS NEW ISSUE OF MONOGRAPH.RESEARCH AIM TO BE ACCELERATORS OF "FLOWING KNOWLEDGE" THROUGH THE SHARING OF EXPERIENCES BETWEEN SCHOLARS AND EXPERTS IN DIFFERENT FIELDS.

List

ARCHITECTURE ECOLOGICAL DESIGN CITY AND LANDSCAPE

book collection

TRANSDISCIPLINARITY: A MENTAL INFRASTRUCTURE IN SEARCH OF A NEW PRAXIS

Ilaria Di Carlo

Ph.D. Architect, researcher and writer. Founder - Ilaria Di Carlo Architects

"The disciplinary structure of knowledge is a problem of fragmentation, a difficulty to be overcome rather than a criterion to be met. Real problems do not observe academic boundaries. We certainly believe that thinking should be 'disciplined' in the sense of observing logic and facts, but not 'disciplinary' in the sense of limiting itself to traditional methodologies and tools that have become enshrined in the academic departments of neoclassical economics."
(Daly H.E. & Farley J., Ecological Economics. Principles and Applications. Island Press: Washington, 2004)

Transdisciplinarity and need for new models

In 1989 Guattari in his eco-philosophical seminal book wrote: 'More than ever today, nature has become inseparable from culture; and if we are to understand the interactions between ecosystems, the mechanosphere, and the social and individual universes of reference, we have to learn to think 'transversally'.'[1] Guattari was envisioning a systemic vision of reality which would embrace its complexity in its relational logics and domains.

This notion of complexity which nowadays permeates all sorts of disciplines is forcing a strong paradigm shift in the ontology of architecture and urban planning and brings along as well the need for a re-evaluation of their hermeneutics.

This is necessary every time the divergence between theory and reality becomes too big, as Thomas Khun used to say[2].

The complexity and 'instability[3]' of our cities require new models for their representation, simulation, analysis and organization, models that can be borrowed from other disciplines like biology, genetics, economy, cybernetics, botanic etc. In fact, as La Cecla puts it, '[...]cities, in their living complexity, seem to interest very little to urban planners, used to chase more or less drastic solutions related to equipment that has been very little updated in the last 50 years. [...] The representation of the complexity is still an 'atlas' made of screens, flows, zoning areas, in which it is extremely difficult to recognize not only a "*genius loci*", but, most of all, a relationship of belonging and mutual influence between the city and its citizens.'[4]

The key to meeting this challenge is to work *transdisciplinarly*, what Guattari called 'transversally'.

Transdisciplinarity is a synthesis between disciplines that breaks down academic barriers and creates new disciplines. Here, the whole is more than the sum of its parts, and the synthesis has to do with Complexity theory.

Transdisciplinarity responds to a need that arises following the loss of once unitary knowledge. It satisfies the desire for a contribution to a resolution of problems which goes beyond a mere juxtaposition of knowledge.

It differs from *Interdisciplinarity,* which is based on communicative logics among ancillary disciplines. Rather, *Transdisciplinarity* establishes relational logics among disciplines that, initially, may have very little in common.

Its essence lies in combining pre-existing elements to create something new, as the work by a University of Parma team on *embodied simulation* theory demonstrates.

One could argue that ***Transdiciplinarity* is a form of infrastructure, ultimately, a *metaphysical* and *mental infrastructure* applied to the search of a new praxis.**

In fact, infrastructures are technical structures (physical components) of interrelated systems that provide commodities and services essential to enabling, sustaining and enhancing societal living conditions. So, Transdisciplinary thought is a theoretical structure (a metaphysical component) of interrelated systems which offers advantages that enable, sustain and enhance conditions in which humans acquire knowledge.

These new borrowed models are, in the end, a 'much more comprehensive set of constructions that allow us to understand the many perspectives on the city that reflect its diversity and plurality.'[5]

The modality itself, intrinsic to the definition of the complexity sciences, is open to embracing many different approaches and models because one of its core aspects deals with the idea that no one approach is predominant.[6]

Such models, with origins in distant domains or regimes, are often viewed with unjustified scepticism about their appropriateness when transferred to ours.

However, to contain and minimise these concerns, it is worth recalling that Le Ricolais, the pioneering father of the space structures, used to say: "matter, material, construction systems, structural configurations, space, and place comprise a continuous spectrum rather than isolated domains. Such an understanding provides a model for organizing forces and their effects that is communicative, reverberating across scales and regimes.'[7]

Considering reality as a *continuous spectrum* is central to understanding the potential of the transdisciplinary approach.

Discourse about urban planning and urban design has already taken advantage of the migration of certain models from other disciplines: cybernetics, biology, geography, mathematics, statistics, computational sociology, etc... , but we are still just at the beginning.

1. Guattari F., *The Three Ecologies*, Athlone Press, London, 2000

2. Khun T., *The Structure of Scientific Revolutions*, University of Chicago Press, Chicago, 1962

3. Instability is meant here with the connotation of '*far from equilibrium*'.

4. La Cecla F., *Contro l'Urbanistica*, Giulio Einaudi editore, Torino, 2015

5. Batty M., *Building a Science of Cities*, UCL Working Papers Series, paper 170, 2011

6. Miller, J. H. and Page S.E., *Complex Adaptive Systems: An Introduction to Computational Models of Social Life*, Princeton University Press, Princeton, NJ. S. E. (2007)

7. Reiser+Umemoto, Atlas of Novel tectonics, NY: Princeton Architectural Press, 2006

A much more radical and bolder attitude is required, as happened in other disciplines. Let's just think for instance to the National Centre for Oncologic Adrotherapy in Pavia[8], where certain type of tumours are treated and cured with the use of protons and carbon ions – adrons - beams emitted by a particle accelerator. Physicians have successfully borrowed physicists' tools to treat malignancies that could not be cured with traditional clinical methods.

We must embark on this overdue adventure so we don't get left behind as an obsolete and useless discipline that can't handle the challenges of contemporary reality. We must leave behind the fear of mistaking or missing the target, since 'if we are afraid to be wrong, we will never come out with something original[9]'.

It is important to keep in mind what Helga Nowotny reminds us about Transdisciplinarity: 'Knowledge, as well as expertise, is inherently transgressive. Nobody has anywhere succeeded for very long in containing knowledge. Knowledge seeps through institutions and structures like water through the pores of a membrane. [...] Transdisciplinarity is therefore about transgressing boundaries.'[10]

Transdisciplinarity hence is about *flowing knowledge*.

Transdisciplinarity and the passage from design to organization.

Discourse about transdisciplinarity exposes another crucial aspect in the definition of the discipline of architecture and urban design: the passage from the mechanical era of *design* to the digital era of *organization*.

From the mechanical era to today, *organization* and its methodologies were mainly the operational field of the urbanists, whose major role was to develop strategic paradigms for cities and territories. In contrast, architects were involved in the production of single buildings, repertories of forms, using their own peculiar *design* or style.

Research into new models for studying and describing the complexity of cities with a transdisciplinary approach implies a sort of 'decontextualization' of the praxis in search for a *meta-language* which would make it possible to properly address models and techniques as they migrate from other disciplines and codes.

During a very stimulating debate held at the Harvard Graduate School of Design in October 2015 entitled 'Organization or design?', Ciro Najle brilliantly pointed out that 'the notion of *design* involves the understanding of architecture (and urban design) as an act of embellishment of the environment to make it agreeable, pleasant, visually amicable and domesticating what we see for the purpose of softening out its sharp edges and therefore making itself liveable. [...] such good intentions are usually perverse and the notion of *organization,* as harsh as it sounds, confronts the wrongness of the conditions of our practice much more directly and takes a vehement distance towards this wrongness.[11]'

In other words, to paraphrase Sanford Kwinter, the way in which *organization* of material reality *transforms* perception and their relationship to feelings, ideas and the *sense of the world* is the new definition of architecture.

The word 'design' has disappeared and we are facing a potential paradigm shift, in which our practice could be defined as *the capacity to transform the sense of the world through organization.*

The word 'organization', moreover, enjoys a privileged position compared to 'design' in respect to two significant concepts in present investigations into the future of architecture and urbanism: *space* and *ecology.*

Organization, as opposed to design, has a deeper, more structural and fundamental epistemological link with the concept of *space*. To organize, in fact, is to methodically arrange parts or elements of something into a structured order within a *space*.

And the concept of space at the present time is of paramount importance in any methodological strategy for our discipline: 'Nowadays to occupy a spatial position might turn out to be as important as it was to keep an ideological position for the vanguards. If the quantity of information produced in the era of late capitalism has devalued representation as vehicle of communication, the system of meanings or of traditional values could be replaced by material or spatial organizations which will work as basis for communication, interchange and consensus.'[12]

Likewise, integral to the definition of organization stands the notion of accomplishing something in an orderly and *efficient* way, i.e. *optimizing* organizational structures, a definition which connects to the concept of ecology.

Indeed, organization is a particularly pertinent term when dealing with complex models about urban sustainability and ecology, since ecology, as Pierre Belanger reminds us, is a form of spatial and territorial organization based on non-linear dynamic foundations.

Again, the term 'organization' has both *formal* and *informal* connotations, which turn out to be quite important in the framework of Complexity theory.

Formal organizations are associated with concepts like equilibrium, rules and regulations. They have determined objectives so they are also deterministic) and founded structures, and are often based on individual responsibilities characterised by central decision-making.

In contrast, *informal* organizations are based on ideas that are 'far from equilibrium' structures, relationships and networks. They have emergent structures and are characterised by decentralised social dynamics and emotional sources.

In contrast to *formal and informal design, formal and informal organizations* do not in any way refer to the reductive acceptation of 'shape', 'appearance', or 'style'. In fact, these kinds of connotations are reductive because they are disciplinary, that is they are related to a specific field or discipline.

Organization is a far more powerful concept. It comes from the Greek *(organon)*, a tool, instrument or medium for achieving

8. For more information on the subject, please visit http://fondazionecnao.it/it/

9. As extrapolated from a lecture given by Sir Ken Robinson on TED, 'Do schools kill creativity?', available on line @ https://www.ted.com/talks/ken_robinson_says_schools_kill_creativity

10. Nowotny H., The potential of Transdisciplinarity, available on line @ http://www.helga-nowotny.eu/downloads/helga_nowotny_b59.pdf

11. Najle C., in *Organization or design*? Architecture symposium held at Harvard GSD, October 2015, available on web @ https://www.youtube.com/watch?v=xRRYDzNg8hA

12. Zaera Polo A., as reported in FOA, backcover of Quaderns 220 (Topografias Operativas), 1998

something. It implies no crystallisation, no impasse, no final results. 'But, because of its intrinsic impossibility, it is an engine, a source of energy and instead of being applied it must be first constructed.[13]'

13. Najle C., *Op. Cit.*

Furthermore, it is an *open* word in the sense that, dissimilar to design, it is not *restricted* to a specific community of masters: it can travel from one discipline to another without losing its power.

Any discipline is a form of organization and models are the conditions of existence of organizations.

That architecture's main scope has been reframed as an organizational one in the digital era of complexity sciences provides an opportunity to expand the configuration of its models by borrowing and hybridizing from other disciplines, by remaining 'disciplined' but not 'disciplinary'.

It is by following this direction that *knowledge* will *flow* and blossom in new, unexpected, powerful and rhizomatic ways empowering a new agency of the architectural discipline.

The Creation of Complexity through Organization: The Living bridges of Cherrapunji, India

THE ARCHITECTURE OF THE INDISCIPLINE*

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"An architect neither should nor could be a grammarian as Aristarchus was but not even an illiterate; nor a musician as Aristossenoma not even an ignorant person in music works; not a painter as Apelles, expert however in drawing; not a sculptor as Myron yet skilled in plastic art; not a doctor as Hippocrates but not without health and hygiene knowledge; lastly he must not particularly excel or be totally ignorant of every other science."
(Vitruvius, *De architectura*, Book I)

* the first paragraph is to be attributed to Chiara Rizzi, the second to Alberto Ulisse.

1. Architecture and third culture

The hypothesis of the subject – here interpreted in a foucaultiano sense – we are now trying to rebuild is based on the migration of the concept of "third culture" in the disciplines that relate to architecture, landscape, city. In this migration process the concept suffers a sense mutation. The proposal, in fact, is to develop a reflection on the architecture capability of being not only an alternative to the separation between the literary and humanistic culture and the scientific-technological one, but rather a form of frontier knowledge between them.

In a sense it is a sort of return to the roots without neglecting what the scientific-technological revolution has brought in the contemporary design culture.

The third culture is a proposal by John Brockman[1] that in the last twenty years has had more and more success up to exercise on science culture and not an influence hardly avoidable in the reflection on the disciplines of architectural design.

1. Cfr. www.edge.org.

Brockman entrusts the definition of his proposal to a book-manifesto[2], whose structure is already a work program. It is a collection of short essays, written by well-known American scientists (physicists, biologists, psychologists, computer technicians and a philosopher) in which each author presents his research and its possible developments for the future global scenario where science and society are closely connected. All contributions are built around those Brockman considers as fundamental themes of the third culture and the main reason of its birth and affirmation: the complexity and evolution.

2. Brockman J. (it. transl. Carra L.), *La terza cultura. Le nuove rivoluzioni scientifiche*, Garzanti, 1995.

Each essay is followed by brief comments of the other authors, a sort of round table where everyone discusses the work of the other one. The purpose is to engage scientists in a debate open to the general public.

In fact, "for third culture he means the activity of those scientists who know how to tell new and interesting things about the world and ourselves: who know how to tell a wide audience, spreading knowledge beyond the narrow confines of the academy".[3]

3. Brockman J., *op.cit.* pag. 7.

The proposal of Brockman resumes the thesis expressed a few decades before by the English novelist Charles Percy Snow in