A MODELISED MANAGEMENT OF MACHINE TRANSFORMATION

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Any similarity with already existing sites would be a mere coincidence.

This analogical attitude is directly derived from the 'Ready Made' concept of Marcel Duchamp, created in 1913 with "The Bicycle Wheel" (M.D. "I liked the idea of having a bicycle wheel in my workshop. I took pleasure in looking at it just as I take pleasure in watching the flames dancing in the chimney".)/4/, then defined in 1917 with the "Fountain" (M.D."Whether Mr. Mutt had made the fountain with his own hands or not is of no importance. He had chosen it. He had taken an element of ordinary existance and arranged it so that its utilitarian significance disappeared under its new title and from the new point of view. He had created a new thought for this object.")/4/.
Since Marcel Duchamp's time, Ready Made forms may also be found in waste, but the application of creativity is still moved from the domain of shape towards the domain of the senses, of identity; this new position might be seen as the acknowledgement of a lack: our modern world overproduces objects and forms which have only a rationalist justification for their existance, or which, once transformed into waste have no possible meaning. The machine allows the production of series of identical objects. The Ready Made concept creates a meaning for this multiutude by taking it out of its functional and/or conventional context, that is by diverting it. However in contrast to Art, whose modern function involves the pure creation of identities, the realisation of this concept in Architecture is inevitably linked to other domains, such as the economy, the recycling of (industrial) waste and the search for other life-styles in the larger sense of the term.

1. CULTURE IS THE OBJECT OF ARCHITECTURE

The field of the present analysis concerns the domain of industrial production, with particular interest in the constructions associated with it. Closely linked to technological knowledge, itself derived directly from scientific research, industrial production is a human creation which, at all levels, invests us with an artificial environment, and is thereby a cultural projection.
Thus a landscape is created and may be modelled into the expression of a culture. The means developed in the 19th century allowed increased manipulation at the geographical scale and, with the passage of time, it is sometimes difficult to recognise which part is natural and which results from Human modelling.
Taken as a cultural - that is to say artificial - interference with a previously "natural" environment, the domain of industrial production becomes the domain of architecture, since culture is the field of architecture.

2. THE FIELD OF THE ANALYSIS: INDUSTRIAL PRODUCTION

Since industrial production contitutes a major element of our modern culture, this analysis will attempt to distinguish several different and separate sub-components of it.

2.1 Industrial Form

Industrial form is dictated by the machine, either through its product, or directly by the machinery itself (which is, in general, the product of other machinery). The *raison d'être* of the machine is serial production, so its product is a multitude of identical objects, and a list of such series might be contained in a catalogue or dictionnary of industrial forms associated with their individual definitions - that is, their functions ("The machine declares its function through its name", Jean Baudrillard /2/).

2.2 The Process

The basis of all industrial production, a process is a series of abstract manipulations which organise the flow of primary materials or of products into a complex of operations and functions which may be organised linearly or in parallel.

2.3 The Factory

Hence, while the process is the programme of the factory; the factory is the site of the process.
We will restrict the present analysis to one type of factory as defined by the industrial architect V. Grenier - the 'Factory-Machine' :"It is a machine, a lime kiln or a smelter, a cement works or a glass oven, a pithead gear. Its form is technical, guided by economy of material and technological makeshifts. It is the work of an Engineer, often beautiful in its simplicity. It is, in itself, a landscape" /3/.

Figure1: Idealised section of a vertical cement kiln.

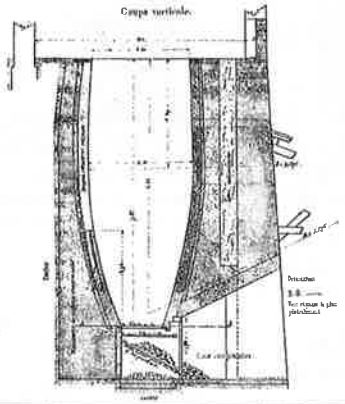


Figure 2: View of old vertical cement kilns: the disused machine as a site or a considerable pre existing shaping of the slop.

2.4 The Machine

Generally, however, the process and the factory are totally dependant on the machinery which justifies their existance: at the same time the machine is a purely functional principle which makes no concessions to values irrelevant to its operation and its composition is minimal with regard to the task it is designed to perform : the relationship between form and function creates an objective, recursive and obligatory duality between the physical constraints of its design and the end result of its construction.
However, in reality, the only construction satisfying this definition is V. Grenier's 'Factory Machine'. On the scale of the building, only this type of factory is itself the machine - the form of the process - and not merely its wrapping.

2.5 The machine as Waste

Once abandoned, such a factory-process is called industrial wasteland. At the scale of the building, it is a disused machine, frozen in a prolonged instant following the end of an activity whose specific nature often renders any alternative use problematic: for, while the machine is an excellent example of a technological object whose production is the direct result of scientific research, its eventual destiny as waste has been taken into account neither by its makers nor by Science.

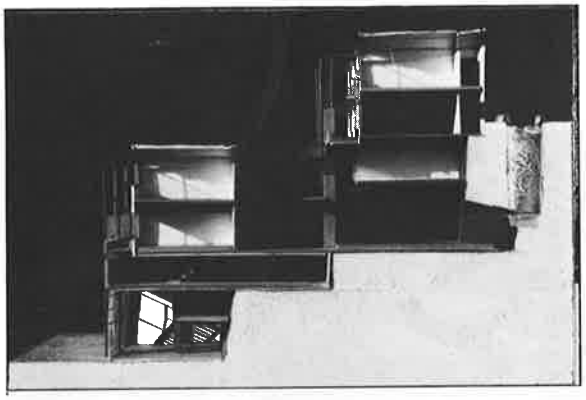


Figure 3: Project for the reconversion of a site into offices (stepped double block united by an interior covered roadway) including a commercial showroom (ground floor of the upper block and backing on the old kilns).
Photographs of a model of a typical section: to build on an existing functional model implies a new functional model.
Interior view of the showroom: transformed into light wells serving sales alcoves in the showroom, the machine "vertical cement kilns" is an example of management of industrial wasteland.

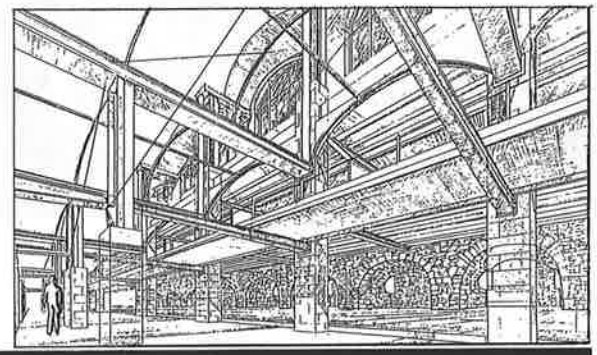
3. ECOLOGICAL DIMENSIONS OF THE INDUSTRIAL WASTELAND

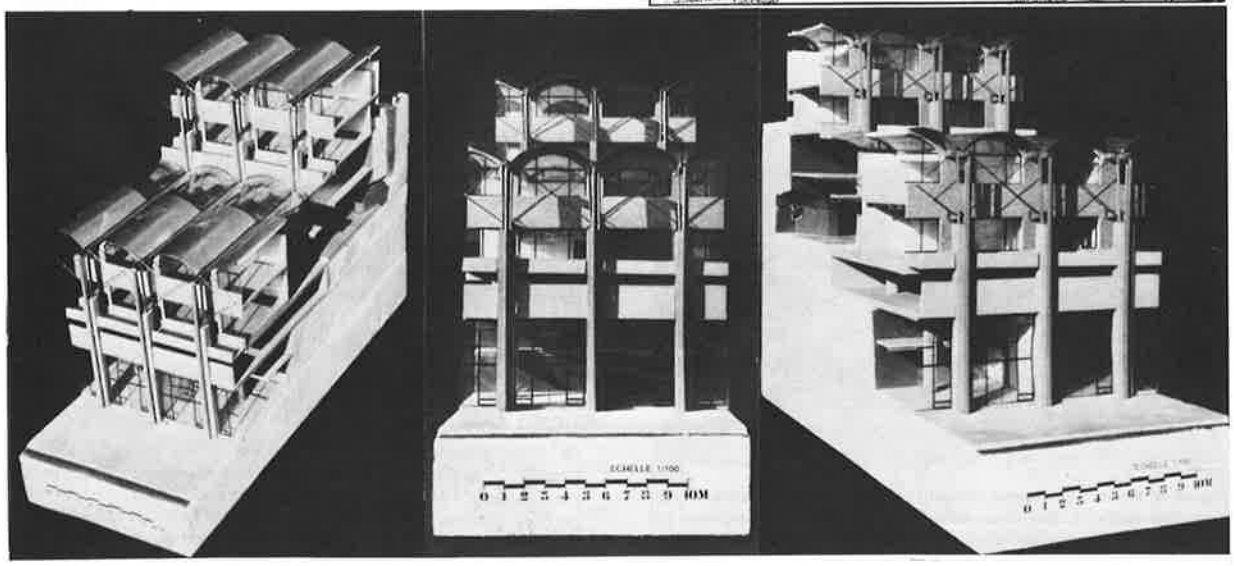
The present state of affairs is indicated by a qualitative measurement of the areas involved which shows this to be a phenomenon on at least an European scale: in a report by Lacaze /4/, 30,000 Ha of industrial wastelands were identified in the Rhur valley in 1980; Great Britain in 1982 had 45,700 Ha, of which 17,000 were being reclaimed, and in France the stock of industrial wasteland in 1986 was estimated at 20,000 Ha.
Elsewhere the same report addresses the need to change our attitudes to industrial wasteland from an approach to rehabilitation based on clasical urbanisation procedures to an approach through the restitution of the landscape and long-term land management. It specifies that "..re-use practically never consists of (...) a return to the previous industrial installation, (...), but will consist in a new change of use, and therefore of appearance, in a zone which has already suffered other transformations." /4/.
From an ecological point of view, it is clear that an industrial sequence can have no "natural" future, being a fundamentally artificial medium. Industrial wastelands therefore represent the special perspective of a site already linked to Human history, prepared ground, and, sometimes, a complex site structure within an urban environment. The problem with this type of structure is generally concerned with its abandonment, that is, a lack of management in the cycle of its transformations.

4. ARCHETECTURE IS A PROJECT FOR HABITABILITY

4.1 The Machine as a Model

Since the machine is a structure built to satisfy the organic requirements of its function and the Factory-Machine is a process comprising a defined number of functions, the identity of function between two machines allows the existance of similar forms in different localities, with minor variations due to site morphology. Viewed from the standpoint of the building, the machine plays the role of a model in the archetectural sense - that is; it is a representation of the set of concepts, references and techniques needed for the realisation of a project.





4.2 A Modelised management of machine transformation

Therefore, seen as an archetectural model, the machine can find its transformation in a counter-model which seeks a new qualification for it and whose elaboration proceeds from Marcel Duchamp's 'Ready Made' concept: **"function follows from form".** Such a project has the property of a transportable system in that the machines themselves are in principal international, but the counter-model will only be valid in its specific interactions with the environment at the level of the different systems necessary to render the space inhabitable (Lighting, heating, urbanization etc...). At the scale of the site, a cement works is a process of industrial production. It contains constructions which have the identity of machines. These constructions either have no internal space, or their internal space is entirely closed off (non-habitable) and usually has the function of a container (of cement, in the various forms imposed on it by the manufacturing process). However, seen as a model, each of these function-machines represents a multitude of analagous forms which may be found on every continent: the appearance of a new and more profitable technique heralds the end of an industrial sequence and is linked to its reappearance as waste, again at multiple sites.
This is the case for the machine "Vertical cement kilns braced into sloping ground" transformed into light wells serving sales alcoves in a commercial showroom (Architectural project for the reconversion of a cement works) ; this is an example of management of industrial wasteland. The project conforms to a multiple 'Ready Made' concept; a new function, which, through its value as a new model, may be repeated as required.

5. PRECESSES BY WHICH INDUSTRIAL FORMS ACQUIRE AN IDENTITY AND A HISTORY

From a cement works to a can, there is an analogy between forms produced by industry; they are cultural forms which modify the original so-called 'natural' environment.
At the scale of the object, the can is an industrial object whose function is to contain a drink. Present in large numbers, and also the visible sign of a cultural imperialism, it may be found on every continent. Emptied and useless, it leaves the shop window to enter the environment. Crushed under a car wheel, it plays an active part in the sedimentology of the town's undersoil.
Although the two forms mentioned above differ radically by their size and by belonging to quite different domains of production: an endproduct on the one hand and an engineering work on the other, we may relate them by the abstraction of their sculptural properties. The analogy may now be found at the level of the geometry of simple forms, of an organic structure guided by the laws of forces and actions, and of a purely operational identity of funtion: filling/storage/emptying. And, in particular, as waste unconsidered by the production process, they both bear witness to the end of their functional state and exhibit a fragment of dead history.
When transformed into an oil lamp (by the artisans of the Comores), the can undergoes mutation and acquires an identity that its industrial destiny did not foresee.
This is the nature of manufacture in recent history: management of the order of transformations where each product is the creation of a cycle, an enrichment of the object with little identity other than its function.

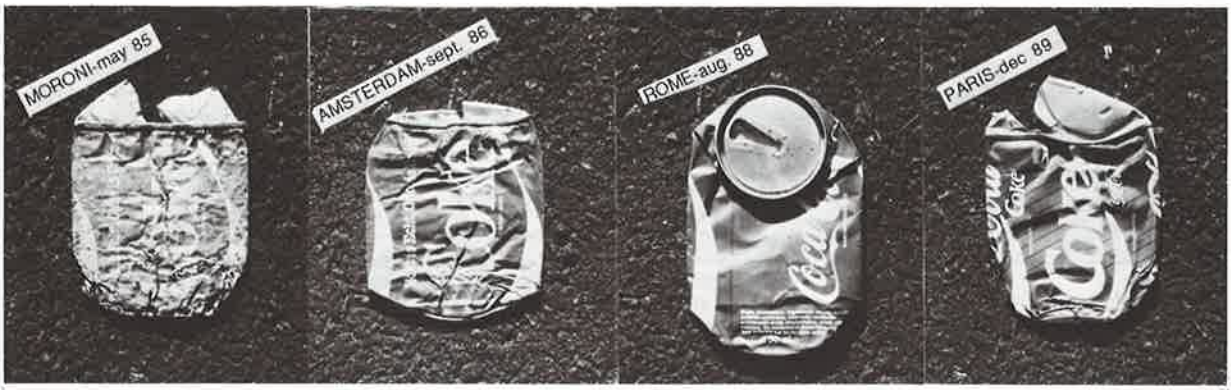


Figure 4: Usually take as a drinking's contain, the can is an industrial product which may be found on every continent. Crushed under a car whell, it plays an active part in the sedimentology of the town's undersoil.

Figure 5: When transformed into an oil lamp (by the artisans of the Comoros islands), the can undergoes mutation and acquires an identity that its industrial destiny did not foresee.

6. CONCLUSIONS AND PERSPECTIVES

As described above, this approach defines the bases of a prospective research which aims to (better) organize the perpetual transformation of the environment which we produce. Based on an example taken from the interior operation of an economy of scarcity emerging from a subsistance economy, and by admitting the analogy that industrial products are involved in a cycle of transmutations which excludes ' left-overs' (particularly 'disposibles'), our economic production system could, at the moment of the conception of a machine or other industrial form, take an analagous attitude and incorporate possible hypotheses for its destiny at the end of its phase of productivity or service, in the form of a catalogue of likely and compatible transformations, taking into account the expected service life of the object.

REFERENCES

/1/ Dixit Marcel Duchamp.
/2/ "Le système des objets" - Jean Baudrillard - © Gallimard -

/3/ "L'archéologie industrielle : quelles usines protéger ?" - V. Grenier - Service de la Recherche Architecturale, Direction de l'Architecture, Ministère de l'Environnement - 1981.
/4/ "Les grandes friches industrielles" - DATAR - Ministère de l'Equipement, du Logement, de l'Aménagement du Territoire et des Transports - La Documentation Française - Paris - 1986.