HISTORICAL, SCIENTIFIC AND EXPERIMENTAL RESEARCHES AIMED AT FINDING NEW TECHNIQUES AND INSTRUMENTS TO RECOVER, PRESERVE AND MANAGE THE XXth CENTURY CULTURAL HERITAGE FOR FUTURE GENERATIONS

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ABSTRACT

The "building recovery" has been the key point of various talks that, since the '60s, have regarded planning and urban landscaping.
The reinforced concrete-ruled XXth century has generated buildings that have resulted technologically flawed, if not altogether unattractive. These flaws can be justified by premature use of certain techniques (not will-known the necessity of historical research), but this can not justify the modern degraded townships, the loss of local urban characteristics and the environmental unbalancing. Where sites are of XXth century cultural heritage? Which are the methodologies for documenting and managing?
This research is aimed at analysing new techniques and materials to address these problems. It also aims to establish the requirements of a reclaim plan. So the techniques for prevention from degradation and structural reclaim, will be studies through the use of traditional, experimental and innovative methodology.

1. INTRODUCTION

The sustainable development is *"the development that is able to satisfy the needs of the present generation, without compromising the possibility that the future generations succeed in satisfying their own needs"* (Brundtlan report Our Common Future-1987)
From 70s we become aware that the resources should be protected through new strategies of development and/or recovery. "Sustainable Recovering" means that we have to make sure that interventions are compatibles with the necessity of improving and protecting life and environmental context quality relatively to future needs, besides the present ones. The direction of the evolutionary processes in the technological field, the creativity and the ideals, will have to aim to forge and to guarantee a better future.

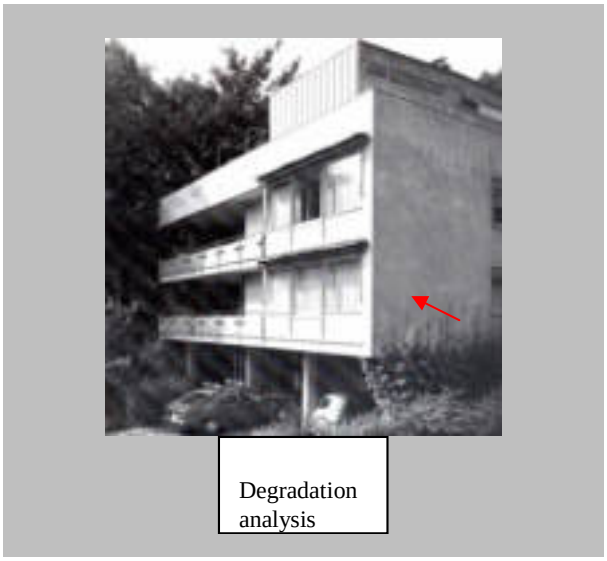


Figure 1. Breuer M., Doltertal Flats, Switzerland

Then the support is directed to guarantee our heritage.
But what is the future of the XXth century architecture, which of our inheritances will we be able to pass on?

2. "SUSTAINABLE RECOVERING" FOR THE XXth CENTURY CULTURAL HERITAGE

During the complex evolutionary run of *"making architecture"* the materials have had a decisive role, both from a merely structural point of view, giving place to more
solid and stronger structures, and from the formal point of view, making the architectural organisms to acquire lightness
and flexibility, a new more consistent with places and times space. In this assertion an evident contradiction is linked to a
great truth, the history is rich in examples: the "building boom" of 50s-60s at the height of the technological evolution, generates the modern "degraded city", the suburbs without quality, the loss of the urban local characteristics, and above all the breaking with the environmental balances. How can we explain such regression? It is not the XXth century culture that has started all this off, like many people are inclined to think, but the part of it that the common sub-culture has wanted and has been able to understand, the building speculation has made all the rest using a new material and a new technique (the reinforced concrete) and adapting it to its own needs, depriving buildings of the more elementary requirements of reliability, of safety, and durability, we have got in front of us the awful

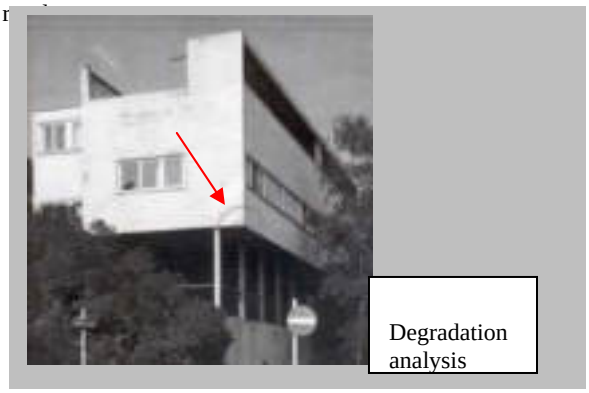


Figure 2. Mies Van Der Rohe, Weissenhofsiedlung, Germany

The argument is far-reaching, but it is important to stress that the XXth century architecture, our modern heritage, will be part of the tradition of the future if we are able to maintain and preserve it, if we are able to resolve the problems of

vulnerability that harass it.
In fact in a large number of constructions built in '900, it is noted the premature ageing therefore, whereas we have not taken part with the necessary and regular work of upkeep, it needs urgently the recovery. The little reliability recently attributed to the "reinforced concrete" is the fruit both *of the lack of quality control procedures concerning all the phases of the building process* and of the lack of control in adapting the form to the structural choices during the planning stage.

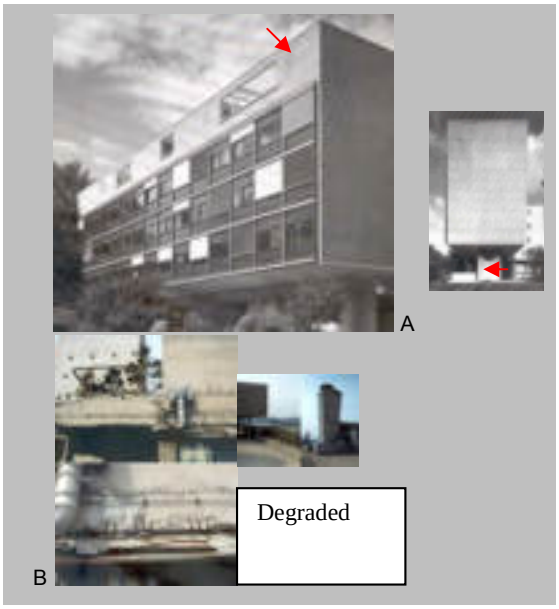


Figure 3. Le Corbusier, A-Citè Universitaire, Paris; B-Unitè d'abitation, particular of the degradation in the elevation

And this consideration is confirmed by precise historical-critics observations. During the years of the Modern Movement the language concerning the form of the manufactured building has had in fact great innovations, both in conceptual terms (think about the principle of "pure line" maintained by Le Corbusier) and in constructive terms.
But in many cases the architectural organisms ignored a whole string of saga cities useful to prevent the degradation in the structures and we assisted at the realization of works of reinforced concrete today poorly reduced.
We can see evidences of such "works" in every part of the world: the unitè d'abitation by Le Corbusier , the Bauhaus by Gropius, buildings by Mies Van Der Rohe, Breuer (Figg.1,2,3)…each of these has become a list of degradations: "efflorescence", ascending humidity, scraping...
Recovering the XXth century architecture taking the right support into consideration means to deepen the basic themes of urban redevelopment with conscience and critical mind, requalifying our more recent works in view of their trasmission in the future. Moreover it means to consider them moderately making part of the cultural patrimony and of our heritage, because, among many inconsistencies, there is an historical experience of formal and material search that should be safeguarded and maintained.
The recovery of the building patrimony, in materialistic but also in cultural terms, has got a determing role in the sphere of the processes of urban transformation, since it is one of the strategies for urban and territorial re-balance and it is the only way to give a future to the architecture of the last generation.
Therefore we have to consider the last century building trade in its historical context, to understand its inner problems not only in technical and structural terms but also in conceptual terms. The purpose is the research of new rules through which such architectures could be set off as cultural and material signs. Evidencies and documents of the new urban identity that, even in the complexity and discontinuity that characterize it, should be saved developping its better qualities. Today we talk about the "restoration of modern" and also in the academic environment we try to make room for new aesthetic rules connected to the discontinuities of the present. Therefore there is the necessity of a new methodological consciousness, in the continuous comparison among historical, social and economic basic themes linked to the planning process and the constructive process "problems". Therefore recovering the XXth century architecture made of reinforced concrete, has to mean not only " to re-develop them" in material terms but also in cultural terms. It becomes necessary to start a debate about a more far-reaching cultural education, which tries to understand what today will be the past of the future, an education which is subject to the historical becoming and to the changing of the times. It needs to base the reasons of the recovery and of the requalifications on vital basis, on a culture immersed in the conflict of the present that should be understood and improved. Stressing the relationship between form and substance can be considered as a suggestion to think over an only apparently rhetorical and passed problem, which is unfortunately present still today.
The scenary of the new city testifies it.

2.1 "Form" and "degradation": the Villaseta case

Inside the debate explained it is interesting to notice the example of a centre risen in the Sicilian territory and exactly in the territory around Agrigento called Villaseta (Fig. 6.-Tav.1). In this quarter of ancient origin (XVII sec.) a new district was built at the threshold of 1966, the urban intervention promoted by the Ministry of Public Works, was entrusted to the Italian section of the International Solar Energy Society (ISES). The technician professionals: M.Ghio; A.Bonafede, R.Calandra, V.Calzolari, S.Lenci, etc .
The quarter was planned according to the rationalist parameters fashionable in that period .

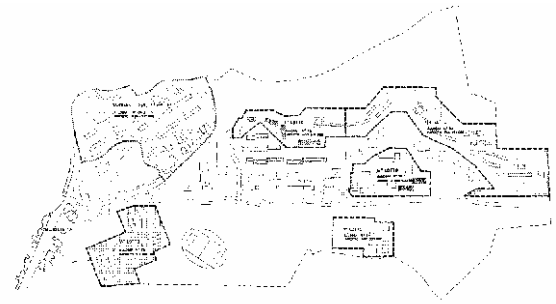
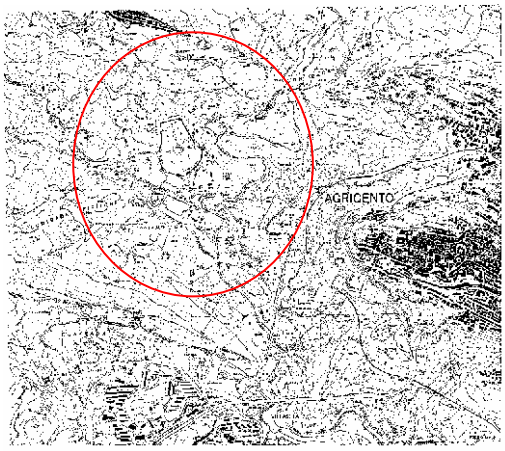


Table 1. Villaseta – AG, the quarter

Table 2. Cartography 1:25.000



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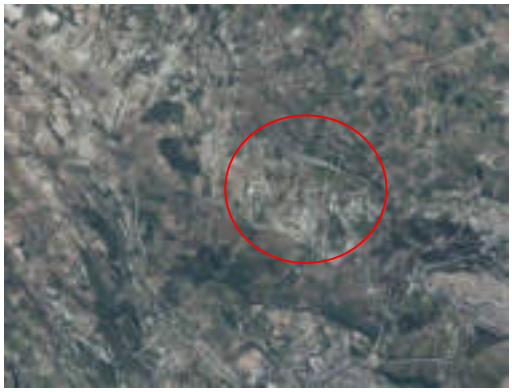
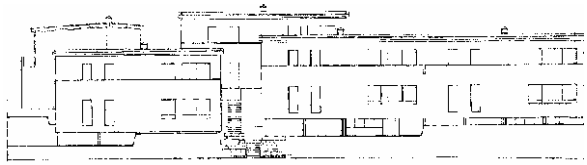


Table 4. Photogrammetry



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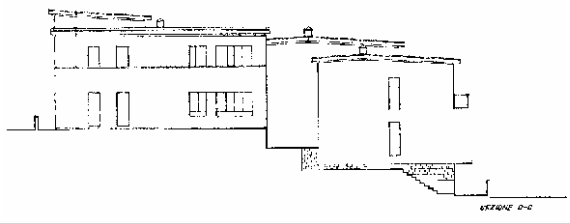

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Table 6. Villaseta – AG, tipology of houses

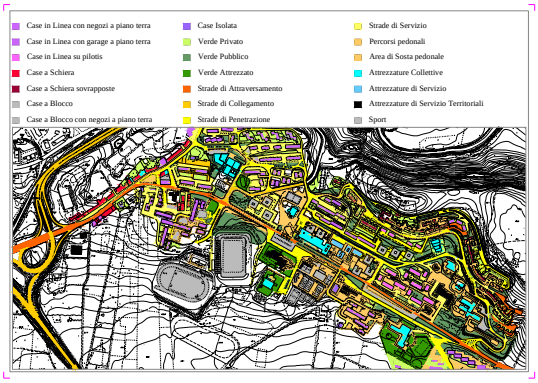

Table 5. Bound areas to the senses of the DD.MM.16/05/1968 (Gui Mancini); DD.MM.7/10/1971 (Misasi - Lauricella); D.P.R.S.13/o6/1991 (Nicolosi); on cartographic base 1:25.000.

Figure 4. Villaseta – AG, tipology of houses terraced

Figure 5. Villaseta – AG, tipology of houses on line on pilotis

Figure 6. Villaseta – AG, tipology of houses in bulk

Figure 7. Villaseta – AG, the structure in reinforced concrete of the trading centre is strongly degraded

Figure 8. Villaseta – AG, spaces before the trading centre

Figure 9. Villaseta – AG, area games park

Figure 10. Villaseta – AG, area games park in state of abandonment the present shapes of degradation are various owing to constructive deficiencies and absence of the maintenance

The variously situated blocks propose terraced houses (Fig.4), in line houses on pilotis (Fig.5), isolated houses, houses in "bulk" (Fig.6), the whole immersed in spaces intended for public green and equipped green, several service areas, the shopping centres and common spaces are planned (348 apartments; 4 schools; 1 trading centre; 1 church; 2 sport services and public services).

Paradoxically seen the brilliant basis, today Villaseta is in a dilapitated, degrading and extremely indecorous state. A ghetto district where the state of desolation and abandonment is breathed in the air that surrounds it (Figg.7,8,9,10).

Beyond every social and political considerations what we perceive is the failure of a certain architecture of the last century that having copied badly from more authoritative examples has produced a building of poor architectural and constructive value. In Villaseta the architecture of reinforced concrete describes in all forms/aspects its dangerous vulnerability.

Figure 11. Villaseta – AG, the structure of the elementary school seems several manifestations of degradation caused from constructive deficiencies and absence of the maintenance

Figure 12. Villaseta – AG, the area of the games park seems strongly degraded zones become inaccessible and unreliable. The structure also being new seems strongly obsolete

The building are in a state of drammatic obsolescence showing a survey complete with degradations and instabilities of physical and functional decomposition (Figg.11, 13, 14,15,16).

The indifference we use to watch at certain phenomenons, especially evident in the South, is impressive at least for two fundamental reasons.

The place needs to be recovered and to become habitable finding an other residence for people who live there; that place contains some territorial valuable vocations in terms of historical and natural pre-existences. Recovering and

requalifying Villaseta is an urban emergency. How can we recover and requalify ... which technologies can we use to redevelop a context that has been waiting for a recovery for a long time. The Villaseta case forms part of the far-reaching debate about the "dead" suburbs. We wonder if it is worth. In fact some people think that certain dilapidated works should be knocked down and re-built.

Figure 13. Particular of the degraded prospect in situated building in Villaseta – AG

And in this optical perhaps few things would remain of the XXth century building. Above all if we are not able to recognize the transmissible heritage, if at the first difficulties we work with the excavator removing the mistakes of a near past too new to be preserve and too old to be recovered.

Figure 14. Particular in prospect of situated building in Villaseta – AG, degradation of cls, the oxidized armor

Figure 15. Villaseta – AG, supporting wall - presence of the humidity of the reclimbing and separations of the plaster for rainwater infiltration

Figure 16. Particular of the wall of the attic in situated building to Villaseta – AG, separation of the plaster of covering of the wall of the attic,: deficiency of abutement stone; machines of humidity and manifestations of the "effluorescenza" in the intrados of the floor of the covering terrace

3. CONCLUSIONS

The research, in correlation between historical study and architectural analysis, aims at the creation of new models of interpretation of the cultural heritage.
The primary task of the research is to mesure the congruence between the semantic and the material value of the good, to estimate its degradation risks, to decrease its vulnerability degree, that is "redeem it", protect it and give it back to the history that has conceived it.
Limiting both material (structural degradations/physical obsolescence –requirements of safety/security) and cultural and environmental (function degradations-disregarded environmental requirements) risks and realizing the just conditions of fitness for human habitation, means to create new perspectives or *"to continue to make history in the knowledge"* according to B. Zevi's opinion.
In the complexity, variety, changeability and vulnerability, that are the categories of the present heritage, we must be careful not to neglect some history pages, but on the contrary we have to recover, protect and maintain them, pursuing new strategies of sustainable balance for the managing of the existing.
- *Program and aims*
In degradation analysis and prevention, this study aims at exploring three levels:

- macrostructure (structural elements and their planning).
- mesostructure (laws and behaviours of sections);
- microstructure (mechanics of materials);

Other aims of this research unit include the evaluation of technical solutions and the set up of innovative instruments of analyses (including an up to date computer program).

Reading parameters:
- analysis of sites;
- analysis of building techniques;
- analysis of structure, materials and function;
- preservation diagnostics according to materials state (creation of data base);
- data and parameters of building degradation;
- evaluation of buildings' useful life;
- effectiveness and durability of reclaim interventions;
- analysis of the connections between the various elements studied;
- experimental analysis of structural reclaim and degradation prevention;
- criteria for checking the various methods through experiment on sample buildings.

Methodological proposals for interventions:
- building procedures for structural reclaim;
- plans for structural reclaims (durability and reliability);
- building procedures for the prevention of degradation (maintenance).

Results:
- structural reclaim methods through new materials;
- check on the validity of the new techniques on a sample building;
- innovative instrument for data analyses (development of applications of photography, photogrammetry, remote sensing and related techniques).

Selected Bibliography:

Boaga G., 1994. L'involucro architettonico. Progetto, degrado e recupero della qualità edilizia, Masson, Milano.
Ciribini G., 1984. Tecnologia e progetto, Celid, Torino.
Di Battista V., 1993. La difficile ricerca della qualità, editoriale in Recuperare n.8/93.
Di Sivo M., 1992. Il progetto di manutenzione, Alinea, Firenze.
Frampton K., GA Document Specialissue 3, 1920-1945, D.A.T.A.Edita, Tokyo
Nardi G., 1986. Le nuove radici antiche, Angeli, Milano.
Vitrano R.M., , 2003. Aulicità del passato ..Inopia del presente, in Atti del Convegno Internazionale – Building envelopes as architecture's messages, Università degli Studi di Napoli Federico II – Facoltà di Ingegneria.

References from Journals:

Brancato F.S., 1983. L'architettura del degrado, in Recuperare n.26, PEG Editoriale, Milano.
Ciribini G., 1983. Durabilità e problemi manutentivi nelle attività di recupero in Recuperare n. 6 luglio-agosto.
Giacchetta A., 2004. "L'opera in pezzi", in Costruire n.255, Settembre.
Giuffrè R., 1994. Qualità dell'architettura o architettura di qualità, Controspazio n.5.
Illustrations of Villaseta by Iacono, Sciortino