



Ada Kwiatkowska*

Archetypes vs. prototypes: cultural and ecological patterns of housing architecture

The ecological movement of the last decade questions the values and directions of development of existing urban structures and announces new principles of building a better world. The career of the word *ecology*, declined in many ways and added to other words, e.g. eco-consciousness, eco-houses, eco-villages or eco-products, is a symptom of this trend. New principles of shaping man's life environment are in opposition to modern patterns of city life and they give priority to ecology over culture. Such values as sustainable living, energy-efficiency and environmental protection seem to be more valuable than freedom of individual choice, diversity of life styles and preservation of local housing patterns. Archetypal forms are drawn from cultural experience and respond

not only to the natural needs of surviving and arranging better settings of man's life, but they also relate to man's wishes to express the spiritual dimension of life (Fig. 1). Prototypical forms are based on technological concepts of structural effectiveness, optimised to develop multi-copies of them, and at the same time they lack symbolic meanings (Fig. 2). Eco-houses are machines designed according to standards of energy-efficiency, reliability of life-supporting systems, autonomy of matter-energy circulation and information accessibility. Eco-standards and technologies generate new design patterns in the form of prototypes or ready-made architecture, that can be built with a narrow range of modification all around the world.

From primitive to ecological ready-made housing architecture

The idea of eco-housing relates to primitive architecture dependent on environmental processes and *homoclimate* [9, p. 6]. Comparative study of the shapes of primitive houses, built in similar climatic zones of the world, shows that flat roofs appear in hot zones, while vaulted roofs – in dry areas (e.g. the research study of Jean Dollfus, [3]). This means that the shapes of primitive houses are influenced more by the climatic than cultural factors, just because the concepts of shelters were created at the early stages of cultural development. Present ideas of eco-houses also respond to climatic challenges, but the prototypical houses come into existence not in the way of adaptation of architectural forms to the surroundings. They are created in laboratories as results of the process of optimisation of the structural parameters according to the principles of structural and energy efficiency [10,

pp. 62–74]. The present housing prototypes are mostly the products of global industrial companies, designed as ready-made housing architecture in research laboratories [13, pp. 146–160]. One of the examples is the project of the Variomatic house, designed by a Dutch architect Kas Oosterhuis, in which the house is defined as a body “[...] integrated into digital communication networks [that] can upgrade itself according to the wishes of its inhabitants or [...] as a reaction to climate change” [11, p. 78].

There is a fundamental difference between primitive archetypes and high-tech prototypes of housing architecture. It can be expressed by such contrary concepts as nest and incubator. Man of native habitation depended on unforeseeable ecological changes and menaces. Man had to adapt himself to variable climatic situations, because the shelter, similarly to the nest, did not protect him very well against extreme weather conditions. The shelter was characterized by a mutable and variable inner microcli-

* Department of Housing Design Faculty of Architecture, Wrocław University of Technology.



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mate. Today, a human being is settled rather in the technological than in the natural environment, in the so-called “integrated home services” [1, p. 112], similarly to the incubator, designed to support the comfort and security for the human being’s body, regardless of the climatic changes. The house is characterized by a constant inner microclimate. Technology, and not man, has to adapt itself to variable situations in the natural environment. This causes that man becomes independent of eco-climatic fluctuations, being dependent at the same time on technology. This dependence could cause the terror of eco-technology in the human being’s surroundings in the near future.

The primitive and high-tech ecological patterns of housing architecture have also a common background. Both of them are deep-rooted in the physical features of place. The ecological pattern of housing architecture aims at closed matter-energy circulation and reversible processes, e.g. land exploitation connected with its re-cultivation. The concept of ecological human settlement traces back to man’s nature as a territorial animal. The ecological movement announces the return of forgotten values and principles of shaping the settings of man’s life in symbiosis with the environment at the beginning of 21st century. The question is whether it is a turning-point in urban development or simply an illusion.

System of values in cultural and ecological patterns of housing architecture

The system of values shared by the inhabitants of a human settlement is usually hidden. There is no written codification of values relating to the quality of common living, however some modern communities, ecologically orientated, express their values in programs, manifestos or rules of common living, e.g. programs of co-housing or intentional communities such as Arcosanti, Cerro Gordo, Eco-village LA, East Wind, N Street in America [6, p. 117]. People express their values, when they talk about expectations of better living or they evaluate the existing housing estates. Therefore, a system of values can be identified thanks to sociological researches relating to the housing quality. The worth of cultural and ecological patterns of human settlements can be generally viewed in the aspects of different concepts of territoriality, spatial codes and social rules.

There is a big difference between cultural and ecological patterns of habitat in territorial identification of their inhabitants. The cultural concept contains the territorial consciousness of the citizens. As long as territory gives a chance to realize its own purposes and makes possible the self-realization of the individuals, people live and work

The present human settlement is the consequence of cultural evolution, therefore it depends more on cultural than natural processes. The cultural pattern of habitat is connected with the concept of the place and its symbolic dimension, concerned about exchange of goods and ideas. The cultural pattern of the human settlement relates to a certain group of people, living together and using specific codes of communication. The city environment is a sophisticated concept, therefore nature is rather manipulated than protected in it. This is the reason, why ecological slogans have ambivalent meanings in built-environment. If the ecological movement meant a search for the new concept of urban structure, it could be interpreted as a movement against the cultural values or as an escape from the city-machine to the natural environment. The question is, whether it would be an escape with or without modern technology, which makes human life comfortable. If the ecological movement meant looking for a new quality of the existing urban structure within culture, it could only be a better way of control and manipulation of natural processes on the higher technological level than it happens now, e.g. the house with a tropical inner microclimate placed in an arctic climatic zone.

The differences between cultural and ecological settlements’ patterns are not only a theoretical problem of evaluation and interpretation of their meanings. They have real consequences in spatial organization of habitats.

there. But if the situation becomes worse, they change their place of living looking for better surroundings. The cultural habit seems to consist of land-exploitation and migration. The cultural idea of settlement expresses search for the *Promised Land*. The fundamental values, contained in cultural patterns of territoriality, are freedom of individual choices and protection of privacy. In traditional meaning, territoriality is based on inheritance and expansion, on settling and mobility. In the cultural concept, the idea of home can be defined as a place of departure and return, person-environment relationships, communication within a culture and connections between the past and the future living [12, pp. 655]. The ecological concept of territoriality is based on the environmental responsibility and sustainability. Therefore the fundamental values, hidden behind it, are integration with biosphere, sharing of the land and its resources in a common, sustainable living [8, pp. 43–47]. It is a concept of man-environment co-evolution, which makes possible staying in one place for the whole life. The idea of ecological settlement expresses a dream of *Eden on Earth*. The ecological concept of territoriality means a place of living, community-environment

Figures: 1. Archetypal form: Chinese Ethnic Culture Park, Beijing, 2. Prototypical form: Exhibition Hall of Chinese Science and Technology, Beijing, 3. Mediterranean culture: the spatial canon of courtyard-housing, Perthus, 4. Scandinavian culture: the spatial pattern of wooden housing, Stockholm, 5. German culture: the spatial pattern of workers-housing, Essen, 6. Roman culture: the spatial pattern of social housing, Paris, 7. English culture: the spatial pattern of suburban housing, London, 8. Dutch culture: the spatial pattern of row housing along the canals, Amsterdam

Ilustracje: 1. Forma archetypiczna: Park Chińskiej Kultury Etnicznej, Pekin, 2. Forma prototypowa: Muzeum Chińskiej Nauki i Technologii, Pekin, 3. Kultura śródziemnomorska: kanon przestrzenny domu atrialnego, Perthus, 4. Kultura skandynawska: wzorzec przestrzenny domu drewnianego, Sztokholm, 5. Kultura germańska: wzorzec przestrzenny zespołu mieszkaniowego dla klasy robotniczej, Essen, 6. Kultura romańska: wzorzec przestrzenny zespołu socjalnego budownictwa mieszkaniowego, Paryż, 7. Kultura angielska: wzorzec przestrzenny domu podmiejskiego, Londyn, 8. Kultura holenderska: wzorzec przestrzenny domów szeregowych wzdłuż kanałów, Amsterdam

relationships and communication within nature, focusing on future growth.

The cultural concept of habitat reflects the spatial codes and archetypes of a certain culture. African, Arabic, Asian, European, American or Australian habitats differ in their scales, structures, programs, spatial codes and their meaning (e.g. centre and margin, private and public space, order and disorder – the spatial categories defined by Edward T. Hall [4]). Some patterns changed in the course of time, but they evolved within a certain culture [5, pp. 14–15]. The present ecological concept of habitat refers to the symbiosis of architecture and nature, therefore it is based on the experience of many cultures. Patterns are drawn from African, native American (Pueblo), European (Monasteries) or American colonial communities [8, pp. 39–43]. The ecological concept is contextual in relation rather to the landscape than to the culture. Territory is possessed by the community, which lives there.

Archetypes and prototypes of housing architecture

The cultural patterns of human settlements express the multi-layered, chaotic structures of the city with conflicted divisions of space into many neighbourhoods. The urban plasma is integrated with anthroposphere. Mental maps of the neighbourhood, created by the inhabitants, differ in identifying their scale, core, mapping and boundaries. Neighbourhood is a subjective spatial unit, pulsating and taking more or less space of the city. The city space is outside and inside of the neighbourhood at the same time. The cultural archetypes of the human settlements are formed around the central square or along the street. The boundaries are well-known only to the inhabitants. Size of the human settlements can be defined more by the subjective psychological than the objective physical factors [2, p. 65]. Private space dominates over public domain in cultural patterns of the human settlements. Private and public zones become stuck with each other, like in Arabic culture, or there are some medial spaces in-between, e.g. semi-private, common, semi-public spaces, like in European or American cultures. Zoning of the space is a traditional means of defence, security and isolation of individuals from the social group. The ways of shaping of housing architecture are regulated by the principles of urban composition, some of them are in force in the local law (distances between buildings, height of buildings), the others have more aesthetic characters (shapes, silhouettes, colours of the housing architecture). Spatial structures of habitats are usually orientated according to the cardinal points, but their orientation depends also on the cultural and urban factors of composition.

The housing space is seen from a very particular point of view, representing the individual aesthetical and economic interests. Cultural patterns of habitats are characterized by such indexes as density, open space or floor area per person etc. Human settlements exploit land and its resources, which causes, that they become worn out in the course of time. The cultural patterns of housing ar-

The cultural concept of social living in a habitat is based on common law, which defines the rights and duties of community members. Traditional pattern is founded on tolerance and coexistence of different beliefs and customs in the neighbourhood, with protection of man's freedom to self-expression within certain limits (e.g. *my home is my castle*). Neighbourhood becomes the cultural environment of man's life, governed by social regulations, expressing the nearness, and not expediency of living together. The ecological concept of social living in a habitat requires sharing of the basic values relating to the environmental responsibility and sustainability, non-exploitative land use, limited growth, acceptance of the complex human interactions, etc. The ecological concept of common living is based on cooperation, co-work, cooperative ownership and participatory self-managing, to maintain balance in the environment treated as a system of connected vessels. The ecological community aspires to social integration and to identification of individuals with the community.

chitecture define the transition space between architecture and nature, and between inner and outer space in the form of porches, verandas, terraces or balconies.

The ecological settlements located in the city or a city consisting of the ecological settlements are quite different visions of the city development than cultural patterns of the cities. The first vision, the ecological housing units located in the city, describes the relation of exclusion. The units are spatially detached, separate, self-managing, self-sufficient and often out of control of local authority. The second vision, the city consisting of ecological settlements, defines the city as a set of self-supporting and self-sufficient units, a colony of mono-cells integrated with the biosphere with city functions in-between. The forms of ecological settlements are rich in variety, e.g. farms, villages, colonies, oasis, condominiums or street complexes. They are characterized by isolation and detachment from urban surroundings. The open spaces of housing complexes are usually in common use. Sharing space means abolishing barriers between individuals and taking defence functions by the social group. The common space dominates over private space. The size of a settlement is defined by objective and physical factors, such as the number of inhabitants or urban density suitable for environmental resources. Ecological settlements are created on the basis of the fundamental principle of complexity, which defines that an object exists not only in spatial dimensions, but it takes part in the matter-energy circulation. The orientation of ecological housing is the result of energy-efficiency and it is subordinated to the necessity of gaining energy from alternative sources (e.g. solar, geo-thermal or wind energy) [7, pp. 65–66].

The ecological pattern of human settlements expresses the efficiency of the whole structure. This means, the effective concentration of architectural objects on a site, and in consequence – non-exploitative land use and minimisation of costs. Ecological habitats, because of their fixed boundaries, propagate the philosophy of a limited

growth and conversion. Ecological patterns of shaping of the housing architecture are based on the principle of reusing of space, regeneration of energy and recycling of matter. The ecological habitats express the symbiosis and fusion of natural and architectural systems in the form of glass-houses, green-rooms, courtyards or hybrid architectural forms.

The fundamental differences between cultural and ecological patterns of housing architecture are revealed in the principles of shaping the housing architecture, and they can be pointed out as follows:

- zoning vs. sharing: establishing of barriers between individuals in the cultural patterns versus abolishing of barriers in the ecological concepts of housing architecture,

- composition vs. complexity: subordination of architectural forms to the aesthetical principles of composition in the cultural patterns versus dependence of forms upon

the structural and environmental complexity in ecological patterns of housing architecture,

- division vs. concentration: partition of space according to the private property and economic value of land in the cultural patterns versus concentration of architectural objects, structural condensation and liberation of land in the ecological pattern,

- expansion vs. conversion: developing of architectural structures on the way of outer expansion in the cultural patterns versus inner-conversion of spatial structures in the ecological patterns,

- wasting vs. recycling: exploitation of land and its resources in the cultural patterns versus reusing and regeneration of land in the ecological patterns,

- transition vs. fusion: establishing of the transition-space between architecture and nature in the cultural patterns versus fusion of architecture and nature in the ecological patterns (*arcology* – union of architecture and ecology).

Future challenges of shaping housing architecture in European cultures

Future challenges in the European cities relate to the problem of sustainable development of the built environment, in the meaning of shaping of the housing architecture according to the necessity of preservation of natural environment, and to the problem of conservation of the cultural heritage of different regions in the aspects of protection of the European cultural roots and habitats' archetypes. Sustainability signifies the new principles of shaping man's life environment, which look for a balance between culture and nature in the future housing architecture. Visions of sustainable habitats' development express different ideas, from ecological housing units detached from the city to the concept of *ecological paths* as part of the complicated city organism, similar to the blood vascular system. The influence of the cultural and ecological factors on the concepts of sustainable habitats' structures is different according to the housing patterns and architectural heritage created in certain cultural zones in Europe.

Cultural and ecological roots of sustainable housing architecture of the Mediterranean cultures can be found in the spatial canon of courtyard-housing, connected with the urban pattern of the dense urban plasma based on the organic or orthogonal street grid. The courtyard-houses are the best examples of achieving architectural and environmental harmony in the micro scale, because of the symbiosis of architectural and natural tissues in one housing structure, and because of the possibility of green-cultivation and the socio-cultural worth of the courtyard (Fig. 3).

The roots of sustainable housing architecture of the Scandinavian cultures can be drawn from the environmental consciousness of the fishermen societies. The Scandinavian model of the sustainable housing expresses the idea of living in wooden detached housing "in the forest" – in natural environment (Fig. 4). This model of environmental sustainability means the co-habitation of architecture and landscape, harmonious co-existence of the green with the architectural structures

and an extensive model of urban planning, connected with cultivation of greenwood.

The roots of sustainable housing architecture of the German (Fig. 5) and Roman cultures (Fig. 6) can be found in different socio-political ideas, focused on the sustainability of social development and equality of the individuals in goods' supplies and rights to dwelling properties. The problem of sustainable housing architecture is a part of the social housing policy, which focuses on the discussion about the available housing standards for the working class and low-income social groups. It generates different models and patterns of social housing, which are subsidized by the state. Composition of the housing complexes is based on the radial or orthogonal patterns of the dense urban structures, and on the spatial canon of the social multi-family prefabricated housing, deep-rooted in the modernistic, post- and beyond-modernistic architectural heritage.

The concept of sustainable English habitat is deep-rooted in traditional culture from one side, and from the other – in architectural visions of sustainable housing environment of the English utopian dreamers. The sustainable life can be identified with living in detached single family houses with private gardens in the suburbs, far from the city centre (Fig. 7). The English pattern of the suburbs, connected with dense single-family housing structure, is based on the radial or orthogonal street grid. This pattern intensifies the mutual relations between people and land, family and neighbourhood, and it strengthens ecological and social consciousness. However, it also forces the urban development of the city structure in the direction of spreading out of the city-boundaries.

The concept of sustainable Dutch habitat has its origin in the tradition of social co-operation because of the dependence of the individual prosperity on the system of common canals, which protect the land from flood (Fig. 8). The concept of canals' network usually precedes the housing development. Housing architecture is under

control of the government or municipal urban planning, which is focused on making the most of land-use and on the future sustainable city development. The spatial patterns of habitats are based on the radial or orthogonal street grid. Dutch housing architecture focuses on the bal-

ance of the individual and social needs, accessibility of housing for low-income social groups, harmony of private and public spaces, and on the unity of architecture and art; unity, which is the canon of modernistic and neo-modernistic architectural heritage.

Conclusions

The ecological patterns of housing architecture define the new quality in shaping of the housing environment, especially in relation to the environmental sustainability. However they also announce some negative processes, connected with technological optimisation of buildings, which could lead to the creation of ready-made houses, regardless of the cultural heritage of a certain place. There are also other consequences of ecological movements, the strengthening of the tendency of spatial exclusion of habitats, caused by the possibility of better control of the environment in small scale than in the large one, and intensification of the human being's fight for the accessibility to the environmental resources (energy, water, friendly climate, lack of disasters), could be a trap for the future sustainable urban development. It could lead to division of the space into pieces of different qualities, competing with each other and blocking the necessary investments in

the situation of a conflict of interests. The other tendency of social integration on the basis of shared common values is a danger for freedom of the individuals, for instance it leads to the limitation or even elimination of the nomadic and vagabond style of life.

That, which we can learn from ecological movements is the system of values and principles of shaping of the housing architecture based on the concepts of sharing, complexity, concentration, conversion, recycling and energy-efficiency. Paradoxically, using the same principles in the scale of city planning could oppose to the creation of the ecological settlements. According to the principles of concentration, complexity and energy-efficiency, the city cannot exist as a colony of mono-cells extending for miles and miles, but it should evolve in the direction of hyper-concentration.

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Archetypy kontra prototypy: kulturowe i ekologiczne wzorce architektury mieszkaniowej

Przyszłe wyzwania w kształtowaniu architektury mieszkaniowej dotyczą kwestii znalezienia równowagi między kulturą i naturą oraz problemu zdefiniowania warunków zrównoważonego rozwoju habitatów w aspekcie ochrony dziedzictwa kulturowego i niezawodności naturalnych systemów podtrzymujących życie. Zrównoważony rozwój oznacza konieczność stworzenia takich zasad i wzorców kształtowania architektury mieszkaniowej, w których wartości ekologiczne, zakładające wydajność energetyczną systemów czy ochronę środowiska, są tak samo ważne, jak wartości kulturowe zakładające zachowanie piękna i ochronę wzorców architektonicznych. Ekotechnologie generują nowe wzorce architektury mieszkaniowej w formie prototypów, które mogą być budowane wszędzie na świecie i które są często w opozycji do kulturowych archetypów i wzorców przestrzennych domów w określonym miejscu.

Różnice między kulturowymi i ekologicznymi wzorcami architektury mieszkaniowej są opisane w aspekcie zróżnicowania koncepcji terytorialności, kodów przestrzennych oraz reguł życia społecznego. Kulturowe i środowiskowe korzenie, które mogą mieć wpływ na przyszłe poszukiwanie równowagi między kulturą a ekotechnologią, między archetypami a prototypami architektury mieszkaniowej, są przedstawione w następujących europejskich kręgach kulturowych: region śródziemnomorski – archetyp przestrzenny domu atrialnego, kultura skandynawska – wzorzec przestrzenny domu drewnianego, kultura germańska i romańska – domy socjalne dla grup społecznych o niskich dochodach, bazujące na dziedzictwie myśli architektury modernistycznej, kultura angielska – dom podmiejski i utopijne wizje harmonijnego środowiska życia człowieka, kultura holenderska – gęsta zabudowa szeregową, wywodząca się z tradycyjnych i modernistycznych wzorców architektury mieszkaniowej.