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Landscape and Natural Colors in Architectural Design

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Abstract: The method of research and design that characterized Gellner has been analyzed in depth in this research and his own steps have been retraced on some themes. The uniqueness of his method lies in the way he transformed the data and information gathered into design outcomes on both a large and small scale by reinterpreting traditional architecture and reconstructing elements of the landscape through its shapes and colors. This method applied to town planning also led other planners to use the elements he synthesized within their projects, creating a contemporary landscape for the great event of the 1956 Winter Olympics in Cortina d'Ampezzo. The purpose of this paper is to highlight the importance of this approach to the transformation of the territory and to emphasize the need to preserve these significant works also in view of the new Olympic event that will cross these valleys in 2026.

Key words: Landscape, colors, Edoardo Gellner, Trampolino Italia, ENI Village.

1. Introduction

Color is one of the essential elements that characterize and qualify any landscape. It changes in time through the seasons with different characteristics in each area. In the Dolomite Mountains (Italy) colors change every season and their transformation is abrupt, from winter's white snow blanket, to spring's fresh green and again from the deep blue of the summer sky to the yellow, orange and red shades of autumn (Fig. 1). In the valley of Cortina d'Ampezzo, this range of hues always stands next to the pink-gray colour of the mountains, that does not change with seasons, and the dark green shades of the Norway spruce (*Picea Abies*) and the Scots pine (*Pinus Sylvestris*) which are both evergreen.

Edoardo Gellner noticed these natural elements from his very first visit to the Ampezzo valley. Through his in-depth method of analysis, he was able to identify several aspects of local rural architecture, which he called anonymous, that tie in with the very structure of the natural environment, merging to create a unique landscape. According to Gellner, landscape is the result of the modification of the natural environment by human activities. His analysis consequently developed

through the study of various themes, from architecture to history and demography while also studying in detail agriculture, livestock breeding and the local economy.

However, the most interesting part of his analytical work is how he translates the collected data within his projects to create new architecture, in which one can see the result of his awareness of the context where he worked. His great ability to use the collected data, shapes, colors, town planning, views, historical alignments is at the core of all his work. Today it is important to recognize its value in order to preserve its memory.

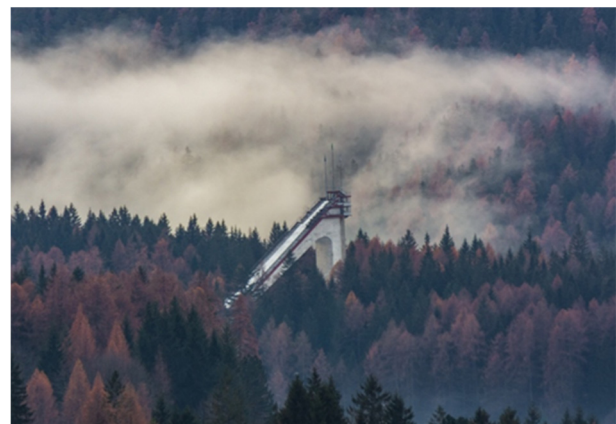**Fig. 1 Trampoline Italia, Cortina d'Ampezzo, between the brown orange of the larches and the green of the spruces (Menardi, 2019).**

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2. Method and Materials

The first step to understand how Gellner was able to use his analyses and translate them into architectural design requires to understand the method he used when analyzing the context.

The earliest documents showing Gellner's visit to Cortina in the 1940's are some sketches of the architecture and landscape [1]. These early drawings portray specific moments that caught Gellner's attention, but the methodical and accurate approach so clearly noticeable in his later works is still missing.

On April 25 1949, he started working in his new studio in Cortina, and from that moment he began the methodical and organized research on the Ampezzo valley. In the early years of his career he had become famous for furnishing hotel's ballrooms, first in Abazia and later in the Alps in Kitzbühel. His fame brought him to Cortina where, as previously mentioned, he decided to live. In Cortina he was asked to work on architectural projects for the first time, as the construction sector was booing due to the upcoming 1956 winter Olympics.

Gellner's analysis developed simultaneously on several themes. In his watercolors he tries to capture the shape of the landscape, which is marked by several layers. The villages of Cortina form the lowest layer, the forest the middle one and the mountains are the highest layer. This complex and layered context characterizes the Ampezzo landscape, which is nevertheless perceived as one unique element in the single views, a landscape in which nature and man's interventions merge with harmony, which is what prompts him to delve deeper into his research. In these same watercolors he pays special attention to the colors of the various elements of the landscape. The Tofana di Rozes mountain, the protagonist of the painting, is painted in a gray-pink color that contrasts with the white of the snow still present on the northern side. The forest of Pocol is darker compared to the light green of the fields that were used as pastures. The houses are small dark spots that form the lower part of the image. Surrounding them we see the last cultivated fields that will disappear from the valley following the economic transition, well documented by Gellner, from agricultural, forest and pastoral activities to a system based only on tourism.

This image of the Tofana was often portrayed by Gellner through another tool important to him, the camera. The same image has been captured hundreds of times from the same viewpoint, the terrace of his studio, to study the changes in color at different times of the day and throughout the seasons [2].

Gellner's use of photography is extremely interesting as he often used it as a scalpel in an attempt to isolate the different details that make up the context and then study them one by one. He used photography also to create panoramas through a collage of different pictures all taken from a single viewpoint thus completely changing the scale of use of the camera. The panoramic images allowed him to analyze the solar exposure of the Ampezzo valley through the hours of the day and at the solstices and equinoxes. He thus discovered that the historical villages, called "viles", are located in the areas with more hours of sun at the winter solstice. One last use he made of the panoramic images was to study the shape of the different sides of the valley to better understand the entries and the general orography.

Using the camera like a scalpel, Gellner also documented several aspects of the Ampezzo valley context [3] such as a scree that cuts through a mountain pine forest (*Pinus mugo turra*) at the foot of Mt. "Lainores", creating a steep white line that cuts through the deep green of the mountain pine forest. He often paused to capture the phenomenon of "enrosadira", which indicates the very bright pink-gray color that the Dolomites show when the sun rays hit them perpendicularly at dawn and sunrise. He especially focused on Croda Marcora, a mountain placed at the entrance of Cortina.

When analyzing the high altitude pastures, he carefully portrayed the thin discontinuous horizontal

lines which characterize the fields that have been used for cattle grazing for hundreds of years. These horizontal lines result precisely from the cattle moving horizontally on steep field for a long time. This element is a change in the natural context caused by human activity, which is exactly how Gellner defines landscape. He also focused on the different kinds of forests, portraying the different colors of a mixed forest. In autumn, these landscape elements are characterized by the green of Norway spruces (*Picea Abies*), the orange-yellow of larches (*Larix decidua*) and the deep brown of beech trees (*Fagus sylvatica*). Some other pictures highlight the uniformity of forests made of a majority of one or two tree species, a selection of plants also operated by men.

Gellner also used his photography skills to document the change in the landscape which occurred when the economy of the valley changed from mainly rural activities to tourism [4] (Fig. 2).

By comparing some historical images, all taken from the same viewpoint, he was able to study the changes in the landscape from 1909, thorough 1923 up to 1943 and then through the 1950's. Looking at these studies it can be easily seen how the fields have been abandoned by farmers and animals. This new empty space was quickly taken by the forest, which changed the pattern of the lower layer of the valley and also made a few colors disappear: like the light blue of flax flowers and

Fig. 2   The "vila" of Cadin di Sopra one of the places least transformed by the advent of tourism (Menardi, 2022).

the white flowers of the broad bean. It was precisely the cultivation of broad beans that had led to the construction of vertical wooden frames as high as 10 m with horizontal elements used to dry the beans. These structures, called "arfe", were located near the houses and characterized the Ampezzo landscape.

All of these tools of analysis were used together with the documentary research conducted in the local historical archives: the municipal one, the parish archives and the documents kept by the *Regole d'Ampezzo*, an ancient form of collective property.

3. Result and Discussion

The previous section reviewed the method of analysis that architect Edoardo Gellner used to study the context where he worked.

In 1950 he was entrusted with the master plan for Cortina d'Ampezzo to be carried out in preparation for the 1956 Winter Olympics [5].

In the early design stage he intensified his research to expand his knowledge of the context even more. At the same time, he used photography as a design tool from the start.

The panoramic images analyzed above were used to create the first design hypotheses. The mapping of the different types of surfaces, wooded areas, fields, ski slopes, villages and all the other elements that make up the landscape were first carried out on the pictures and only later transferred on the actual architectural plans. This method was also applied to the newly designed part: the design hypothesis were sketched and then transferred on these panoramic images of the valley to better understand the implications that each choice would have had in each individual area. By proceeding with this method, Gellner was able to control extremely complex elements, such as the construction of a new road system along with several new facilities and services. The hypotheses were later developed through the technical drawings, then either confirmed or modified and then verified once again on the panoramic pictures as the last step. This method guaranteed that

the project had a high landscape quality, changing the town in terms of services and facilities but without altering the landscape too much, landscape that was then drastically changed by the building boom of the 1960s.

Gellner also used the photographic tool of panoramic images to plan the construction of the "new center" of the town. In this once-free space, he selected some panoramic views which were to remain free from buildings in order to show the surrounding mountains. Once these views had been selected, he worked on the buildings' design, using models to study their dimensions and position, and also checking how they would fit in the views through the use of photo collages (Fig. 3).

Another characteristic of Gellner's work is using color in his projects, choosing colors from the landscape for the facings of buildings. Looking at the Post and Telegraph building "TELVE", for example, he chose the gray-pink typical of "enrosadira" for the facing, along with a sky-blue shade. When designing the "Giavi House", in addition to taking the rigid frame of rural curtain wall structures and building it in reinforced concrete, he used sky-blue and yellow, brown shades inspired by the mixed woods to decorate the different facings of the building. All the elements analyzed during the study phase were taken in consideration, processed and arranged within his architectures, thus constructing this singular working method.

In order to best illustrate how Gellner used these analyses in his projects we will analyze his most famous architecture, the ENI Village in Borca di Cadore. The village is to be considered a unique project: the construction of an entire portion of the Boite River Valley landscape. It was built during the 1950s and early 1960s up until the death of the commissioner of the project, Enrico Mattei.

ENI proposed various potential areas to Gellner, asking him to decide which would be the best one to build the village in. After a thorough study of each area,

Gellner judged them all to be inadequate and rejected them. He then suggested the debris deposit on the slopes of Mt. Antelao as a possible area for the project that ENI had in mind. The main reason for his choice being that the area consisted in quite a big scree and a few Scots pines (*Pinus Sylvestris*) and did not carry any specific landscape value, unlike the other areas proposed by ENI.

Gellner applied his method of context analysis from the start, and we can see how this method almost immediately transformed into a design phase. All the structures in the village have an almost flat roof, except for the large communal buildings such as the church, lecture hall, and living rooms. All these small horizontal lines that characterize the steep slope are reminiscent of the lines caused by cattle grazing. This is particularly evident in the front image of the village.

The buildings were designed with a ventilated roof. This technology allows the snow to be kept on the roofs in winter just like the barn structures do. The building structures therefore create a dark image that contrasts to the snow seen in the landscape and on roofs.

The entire village thus turns out to be an element of the landscape itself, as it was conceived to be from the beginning. In fact, despite the huge size of the village (it is composed of 17 pavilions and more than 200 cottages), it is currently hardly noticeable. Only in recent years the windstorm VAIA, which hit these valleys in 2018, made the presence of the village more evident, tearing down an entire forest next to the village, also causing damages to some of the buildings (Fig. 4).

Fig. 3 Panoramic view of Mount Faloria portrayed from the same point as Gellner's panoramas (Menardi 2021 produced in collaboration with Iuav's University Photogrammetry Lab).

Fig. 4 A group of houses in the ENI village photographed by a drone, it can be seen how the snow remains on the roofs and how horizontal lines characterize the landscape (Menardi, 2022).

The entire structure was built taking into consideration the best possible sun exposure. After studying various images of the area to analyze the sun movements through the year, Gellner thus decided to make all the cottages face south.

This project best exemplifies Gellner's work, his attention to landscape issues, his use of the collected information to create contemporary designs from a small to a larger scale, all aimed at improving the context in which his architecture was built.

4. Some Other Key Points and Thoughts

As we have seen above, color is a key element of all Gellner's architecture in the Dolomites. Nevertheless, his works vary in the architectural composition, and the use of color along with the purpose of its use change in each project.

In the ENI village for example, Gellner transforms some of the colors that would only be present in the landscape in specific times of the year into a permanent characteristic of the village. This is not the only purpose for which Gellner uses color though. The extent of this architecture and the somewhat inevitable repetitive design of the buildings could have made the overall project look monotonous. The colony with its pavilions and the countless connecting corridors and ramps, the cottages scattered across the steep slope are all potential standardized elements. In this case, Gellner used color

to limit the perception of standardization: the facings in the frame structures are all the same, but the color changes from one facing to the other along with different color combinations, thus giving a unique touch to each corridor and cottage, turning them into very distinctive elements. This approach was applied both to the outer part of the architecture and to the inside. In fact, all the corridors, even internally, are finished in different coolers (Fig. 5).

This choice allows bringing the colors of the outer landscape inside the buildings, while at the same time limiting the feeling of standardized production, making each element of the structure recognizable. In the dormitories, the color of the floor and walls changes for each strip consisting of two beds. This also allows the children to easily recognize their own space in a series of dozens of beds that would otherwise all look identical. This way of interpreting the use of color is very similar to the one Bruno Taut shows in the Hufeisensiedlung in Berlin, where the color of the entrances is always changing in an attempt to make standardization unique [3].

The impact of Gellner's work to identify and use landscape colors in architecture goes beyond the buildings that he designed. The master plan he created for the Seventh Winter Olympics was applied to the entire valley and some of the color elements found in the plan have been used on a larger scale and also in other architectures.

Fig. 5 Polychromy inside the ENI village (Menardi, 2021).

Fig. 6   The trampoline Italia with its polychromes that stand out at sun (Menardi, 2019).

The towering elements such as flag poles and parapets were painted in an intense sky-blue that recalls the summer skies. This was done throughout the valley precisely to give uniformity to the whole context. Even today, many elements still present within the area are painted in the same sky-blue that is called "Olympics blue" by local workers (Fig. 6).

One piece of architecture built for the 1956 Games in which we can still see this use of color is the "Trampolino Italia". The structure, built for ski jumping competitions and used until the 1990s, has now obviously fallen into disrepair. The ski jump is one of the few architectural landmarks in the valley. The mountains are the dominant feature in this scenery and there are only three architectures that can be defined as landmarks in the Ampezzo basin: the ski jump, the bell tower and the military shrine. The ski jump facility is located at the main entrance of the town, and it towers over a glacial moraine covered in conifers. This unique piece of architecture was designed by Professor Piero Pozzati of the University of Engineering in Bologna and built by the Mantovani construction company. The entire jumping area is divided into three main elements: the outrun and the landing area with the grandstands, that together form the lower part of the composition, and the inrun, which represents the upper part. The structure of the inrun was made of partially pre-stressed reinforced concrete and it consists of a 90 m long slender beam, with the highest point of the structure measuring 54 m from the base. The concrete structures were completed in only 73 days, since the construction works started in April 1955, only 10 months before the start of the Games. From a technical point of view the structure of the ski jump is extremely audacious, as the inclined beam has a thickness of only 2.54 m at its thinnest point. This was made possible by the great design skills of Professor Pozzati and the technical skills of the Mantovani company. Color is again a very interesting element of this structure: even though today it is hard to perceive it due to the state of disrepair of the ski jump, it is important to take it into consideration to understand the connection with the landscape. The colors chosen for the inrun are the same as those used in many of the facilities of the 1956 Olympics. This choice follows a specific design goal, which is stated in the official report of the Seventh Winter Olympics, where we read that "The structure has been reduced to its essential profile". This design goal was achieved not only through special and innovative structural techniques, but also through a reasoned use of color. The profile of the inrun is highlighted by the red metal sheet that runs along the edges, which contrasts both with the green trees in the background, and with the white of the main structure. A grey-pink color, which recalls the "enrosadira", was chosen for the elements that are not part of the main structure. Finally, a light sky-blue was used for the finishing elements such as parapets and flagpoles, which would almost disappear when seen against the sky. The striking red profile squeezed between the white of the snow on the inrun and the main structure highlights the main line of this project, while the pink of the take-off (lowest part of the inrun), that lights up with the evening light, makes the ski jump become part of the "enrosadira". The parapets that divided the various sectors of the audience and delimited the access routes were also made of white unbarked birch roundwood so that they could disappear in the white of the snow. This careful use of color is undoubtedly one of the reasons that contributed to the immediate appreciation of such a modern project in a

very conservative environment like Cortina, unlike the above-mentioned Telve palace. In fact, even today, despite its current state of disrepair, everyone recognizes it as a symbol, as opposed to Gellner's works in the town center, which most people still do not understand. One other reason for the community's "acceptance" of this project is the fact that it is not located in the historic town center. Being placed on top of a hill, it is somewhat isolated from everything else, which allows it to be observed on its own without comparing it to other structures.

Looking at this structure, which represents a new element in the complex landscape of the Ampezzo valley, it is clear that the results of Gellner's studies on color were taken up by other designers, who reinterpreted his research and used it in their own works.

5. Conclusions

This research aims to highlight Gellner's ability to turn his research and collected data into design and also to show how he was able to transform his knowledge into architectural composition. The great importance of knowing these dynamics translates in the need of preserving these unique structures, that fit so well in the context, through a restoration project. This very place will host the Olympic Winter Games in 2026: the event will have a positive outcome like it did in 1956 only if it is able to build an equally intense and constructive exchange with the area and the local community.

References

[1]   Merlo, M. 2009. *Edoardo Gellner. Quasi un diario, appunti autobiografici di un architetto.* Roma: Gangemi. (in Italian)

[2]   Carraro, M., and Domenichini, R. 2015. *Architettura, Paesaggio, fotografia. Studi sull'archivio di Edoardo Gellner.* Padova: Il poligrafo, Venezia, IUAV. (in Italian)

[3]   Gellner, E. 1988. *Architettura Rurale nelle Dolomiti venete.* Dolomiti: Cortina d'Ampezzo. (in Italian)

[4]   Gellner, E. 1981. *Architettura anonima Ampezzana.* Padova: F. Muzzio. (in Italian)

[5]   Mancuso, F. 1996. *Edoardo Gellner. Il mestiere dell'architetto.* Milano: Electa. (in Italian)