

Draped Plant Renewal-Guangzhou Cigarette Factory No.2 Renovation Design

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Abstract: With the development of urban economy and the upgrading of industrial structure, a large number of industrial enterprises in the city have moved from the center to the periphery in order to alleviate the land pressure brought by urban development. A large number of factories lose their own construction function and are gradually abandoned. As an important carrier for the continuation of urban renewal and economic construction, there development of industrial abandoned buildings is related to the development of urban economy and renewal. Reconstruction and reuse of industrial heritage to improve people's living standards and develop the city has become the desire of people. How to properly protect and renew the industrial architectural heritage has become a topic worthy of in-depth study for urban renewal in China. Pendant Renewal - Renovation Design of Guangzhou Cigarette Factory No.2 is based on the perspective of "redevelopment and reuse of industrial architectural heritage" and discusses its related strategies, focusing on strategic renovation, using multiple methods to conduct research and summarize the strategies of industrial heritage renovation. It explores the problems and references that exist in the renewal and reuse of industrial heritage. Taking narrative space regeneration, natural ecological sustainable development, historical and cultural inheritance development and other related theoretical methods as the theoretical basis for transformation and renewal, in order to get rid of the template industrial building transformation mode, we holistically study the sustainable transformation strategy of industrial architectural heritage based on the perspective of narrative space and time. It is hoped that this case study will provide a useful reference path for the research and development of industrial architectural heritage.

Keywords: Industrial Heritage; Narrative Space; Pendant Renewal; Urban Renewal.

1. Introduction

1.1. Background of the Study

With the rapid development of urbanization and industrial restructuring in China, the number of abandoned industrial buildings in cities is increasing.

The number of abandoned industrial buildings in cities is increasing. After the state gradually emphasizes the construction mode of sustainable, recyclable, green and energy-saving, and effective maintenance of social stability, in recent years, the report of the 18th National Congress has clearly proposed to strongly recommend the development layout of "five-in-one". In recent years, the report of the 18th National Congress has clearly proposed to vigorously recommend the development layout of "five-in-one", and the renovation of old industrial buildings has become the topic of urban renewal research. The renovation of old industrial buildings has become a topic of urban renewal research.

In order to better understand and solve the problems of old factory renovation, this study takes the old factory area of the former Guangzhou Cigarette Factory No.2 (hereinafter referred to as Cigarette Factory No.2) as the basis for renovation. Hereinafter referred to as Cigarette Factory No.2) as an example, this study aims to explore the development concept and green sustainable aspects of industrial heritage renovation in order to contribute to the research and practice in related fields. This study aims to explore the development concept and green sustainable aspects of industrial heritage renovation, so as to provide useful thoughts and experiences for the research and practice in related fields.

1.2. Purpose and Significance of the Study

The purpose of this study is to reveal the current status and

problems of old factory renovation through systematic analysis and comprehensive evaluation of existing research and our practice, research and practice in the field of urban renewal, to enhance the aesthetic, social and economic values in the renewal of old factory renovation, and to promote the progress of the protection and utilization of industrial architectural heritage.

Current urban renewal research in practice or application of innovative renovation continues to emerge, but deeper obstacles still accompany urban development for a long time. China's research on the transformation of old factories is relatively late, and the research is also relatively general, lacking the deepening analysis of each specific content. In the actual project, there are many old factories renovation of land utilization rate is insufficient, the lack of local cultural atmosphere, the overall vitality of the park is insufficient. To address this problem, how to make more attractive transformation to promote the development of the entire old factory area has become a topic worthy of in-depth study. Therefore, the study on the transformation of old factories into entrepreneurial industrial parks is very urgent and of great significance.

1.3. Domestic and International Research Status

1.3.1. Status of Domestic Research

Around 2000, most cities in China gradually entered the industrial decline period, and the revitalization and reuse of industrial heritage became one of the focuses of urban construction [1]. Many cities have launched the transformation of old urban areas and old factories, which provides an important theoretical basis and reference for the transformation of China's industrial heritage, but for the time being, there are still a lot of difficulties in the transformation

of China's industrial heritage, such as the generalization of research, functional homogenization, spatial morphology independence, and cultural inheritance disconnection. In actual operation, such as transformation technology, transformation concepts, development management and other imperfections, making these aspects of the transformation of old factories still need to be improved.

1.3.2. Current Status of Foreign Research

The research on industrial heritage reconstruction in western countries started as early as the 1960s, and foreign scholars have explored it in various aspects. The concept of "industrial heritage reconstruction and reuse" was introduced by TICCIH as early as in 2003 through the publication *As early as 2003, the concept of "reconstruction and reuse of industrial heritage" was clearly defined by TICCIH through the promulgation of the Tagil Charter for Industrial Heritage and the Burra Charter*[2]. Reconstruction and reuse of industrial heritage has become a key issue in the field of international heritage conservation. The research topics have been gradually refined and focused, and researchers have continued to innovate and integrate their research methods and perspectives to varying degrees. An analysis of the research published in the last five years in this field reveals that the current research on the reconstruction and development of industrial heritage has been very successful.

Through the analysis of the studies published in this field in the past five years, the current research on the reconstruction and reuse of industrial heritage still needs to be improved and strengthened, such as the heritage protection and management system, the planning system and the institutional environment, and the problems of "hollowing out" and "annihilating" of industrial heritage. These shortcomings can help future researchers to develop new directions in this field.

1.4. Content and Methodology of the Study

1.4.1. Research

Using a variety of means, such as document review, on-site research, and case study analysis, an in-depth discussion on how to carry out the remediation of the second factory of cigarettes was carried out. First of all, the research background and significance of this topic is analyzed, combined with the current situation in China, the current development of industrial heritage renovation in China is analyzed in detail, and measures are taken to renovate the cigarette factory No.2 in view of the main problems and the main issues it is currently facing. In order to provide some references for the renewal and reconstruction of industrial heritage.

1.4.2. Research Methodology

This remodeling adopts a variety of research methods, in-depth interviews, fieldwork, and literature analysis. The existing research and practice materials are collected and analyzed, supplemented by field research and expert interviews. The specific methods are as follows.

1) Literature review research method; through reviewing academic papers, research reports and policy documents related to the remodeling of industrial architectural heritage, the research method of Cigarette No. 2 was analyzed.

By reviewing academic papers, research reports and policy documents related to the transformation of industrial architectural heritage, the research and practice of Cigarette Factory No.2 were systematically analyzed and comprehensively evaluated;

2) Empirical research method: through field visits, expert interviews, community participation, street interviews, etc., to collect information about the actual situation of the factory.

Through field visits, expert interviews, community participation, street interviews and other methods, collect actual data and information about the factory, deeply understand and analyze the current situation and problems of the factory, and analyze the situation from the perspective of the factory's radiation.

The research will be conducted in the area radiating from the factory;

3) Case study method: through the case study of the existing industrial buildings and similar heritage transformation, we analyze the specific content and other aspects, and come up with a more specific, more accurate, and more effective solution to the problem of industrial buildings.

The case study method: Through the case study of the existing industrial buildings and the transformation of the similar heritage, we analyze the specific contents and draw the specific and relevant conclusions, combine the theory with the reality, and synthesize multiple aspects.

Theory and practice are combined in a comprehensive and multifaceted way to draw relevant insights[3].

2. Relevant Concepts and Case Studies

2.1. Elaboration of Concepts Related to the Transformation of Industrial Heritage

2.1.1. Architectural Remodeling based on Spatial Narrative Theory

"Spatial Narrative" is to take narrative as the focus of spatial creation, and convey information to the people who are in the space through the spatial environment. The theory of spatial and temporal narrative is a worthy approach and strategy for the construction of industrial heritage reconstruction and reuse. Using the thinking of spatial narrative, the spatial environment is extended and expanded in the time dimension, so that the new enclosure and the old enclosure are both symbiotic and communal [3]. We try to combine spatial narrative with architectural heritage regeneration, and initially explore the concept of "spatial narrative", the logic of thinking, and the operation method of the transformation strategy in the context of architecture[4].

2.1.2. The Concept of "Vertical Greening"

That is, vertical greening, along the building facade development, the use of plant materials for planting, climbing and hanging, etc., to form a vertical greening generation, mostly used in urban centers with tight land constraints on the building, in the vertical plane to increase the greening rate.

China's big city planning and construction, especially the industrial building complex exists due to the lack of green area caused by the deterioration of the ecological environment[5], based on this, we summarize the characteristics of urban vertical greening and development conditions, proposed to vertical greening combined with the form of plane greening construction to improve the current situation of the lack of greening rate of the industrial buildings, so that the limited land to achieve high efficiency of greening, increase the greening area, enhance the overall greening of the city, and increase the overall greening of the city, mostly used in the city center buildings with tight land. Increase the greening area and enhance the overall urban style.

2.2. Case Study of Industrial Heritage Transformation

Iteration, Narrative and Regeneration: Design Practice of Display and Renovation of Industrial Building Relics - Through the “iteration” of physical space and virtual space, the office building of the Republic of China Metropolitan Waterworks, which was transformed from the original old site,

was broken to realize spatial regeneration. (As shown in Figure 1).

In the reconstruction and remodeling of industrial architectural heritage, the design goal should not only be to attract the public to participate in the viewing and stopping, but also to think more diversely about how to establish a viscous and long-lasting connection through the process of display and design[6].



Figure 1. Partial real photo references

The ROLEX Academic Center, located at the Federal Polytechnic Institute in Swiss, Switzerland, offers 20,000 square meters of continuous, single-story mobile space for a variety of activities. The design concept is based on the human mind, focusing on the organization of the interior space and the experience generated by the people in the space, aiming to present the space in the most direct and simple way.

The architect tries to provide users with more freedom of exploration and to create different spatial experiences, taking “building as a park” as the spatial concept. The continuous space produces the upward and downward movement of the inner space of the flat slab, which is like a miniature topography, blocking people's view and creating a conscious (as shown in Figs. 2 and 3) spatial division. People often long for a smooth state, but the slightly inclined floor interface makes people feel unstable, and guides the experience users to look for a smooth interface, so that people can generate mobility, and space naturally generates a sense of flow[7].



Figure 2. Aerial view of Rolex Academic Center references



Figure 3. Rolex Academic Center Elevation references

3. Cigarette Factory No. 2's Basic Overview and Current Situation Analysis

3.1. Regional Positioning of Cigarette Factory No.2

Guangzhou Cigarette Factory No.2 project is located in Liwan District, Guangzhou City, Guangdong Province, Zhongqi Road, the intersection of the two main roads of the two cities, Zhongshan 7 Road and Kangwang Road, metro line 1 and 8 double metro cover, located in the core of the old

city of Liwan, has a unique geographical location. The project covers an area of nearly 50,000 square meters, and the scope of our renovation is the experimental site, which covers an area of about 3,989 square meters (as shown in Figures 4,5).



Figure 4. Aerial view of Cigarette Factory 2 references



Figure 5. Floor plan of Cigarette Factory No. 2 references

3.2. Analysis of the Current Situation of Cigarette Factory No.2

3.2.1. Analysis of the Surrounding Environment

The neighborhood of Cigarette Factory No. 2 is characterized by a dense road network, a variety of buildings, and is close to several subway exits and only one way away from the Chen Family Ancestral Temple, with a strong historical and humanistic heritage. The park is surrounded by banyan trees and there are a number of famous recreational attractions in the vicinity (as shown in Figures 6).



Figure 6. Cigarette Factory No. 2 surroundings references

3.2.2. Transportation Analysis

The transportation structure of the project site of Cigarette

Factory No.2 is relatively simple, with Zhongshan 7th Road and Kangwang Road, the main roads, guaranteeing direct access (as shown in Figures 7).



Figure 7. Cigarette Factory 2 Traffic Analysis references

3.3. History of Cigarette Factory No.2

The former Guangzhou Cigarette Factory No.2 is located

in the center of Liwan district North Area in Guangzhou, Guangdong Province. It was founded in 1905 by the patriotic overseas Chinese brothers Jian Zhaonan and Jian Yuji as the

Nanyang Brothers Tobacco Company, and launched the “Double Happiness” brand of cigarettes in 1906. It has witnessed the great history of Guangzhou's tobacco industry. It carries rich urban memory and is a representative heritage of China's modern tobacco industry. It has a strong historical and cultural background.

3.4. Analysis of the Problems of Cigarette Factory No.2

With the development of urban economy and upgrading of industrial structure, Cigarette Factory No.2 is facing multiple problems. Spatially, it lacks infrastructure and has a single function; ecologically, the greening rate is far lower than the urban greening requirements; culturally, it has a high level of greening. Cigarette Factory No. 2's cultural and historical heritage challenges; and industrially, chaotic business management and industrial upgrading and transfer.

3.5. Demand for Cigarette Factory No.2

After conducting interviews and in-depth research on the needs of the people around Cigarette Factory No.2, we summarized the basic characteristics of the people, organized the needs of people's activities, and analyzed the needs of the people, and found that people's needs for rich daily life, diverse public spaces, and unique industrial cultures are diversified and complex. Therefore, the design of the renovation of Cigarette Factory No.2 needs to deeply explore the motivation behind the needs of the group in order to make the industrial heritage a more attractive urban public place.

3.6. Positioning of Cigarette Factory No. 2 for Development

With regard to the basic overview and current situation of Cigarette Factory No.2 mentioned above, firstly, the development of Cigarette Factory No.2 should be integrated into the area of Guangzhou Chenjiachi and even the whole central city, so it needs to be organized in a new spatial pattern, and to be integrated with the rich ecological environment of the area, the organic fusion of the national culture, and the fusion of the cultural and creative industries. Therefore, its development is positioned as follows:

(1) A fashionable and energetic public center of Guangzhou Chen Jia Shi cultural zone. The future development of Cigarette Factory No.2 should rely on the existing geographical advantages, and actively develop and organize a new spatial pattern to meet the growing needs of the community. At the same time, it should undertake the radiation of other attractions in the vicinity, integrate and develop supporting infrastructure; innovate and develop new spatial patterns of large-scale cultural activities, and drive the economic and cultural development of the surrounding area.

(2) Industrial culture and comfortable and pleasant green ecological urban neighborhood, the development of green ecological environment in the area, based on the unique industrial culture of the Second Cigarette Factory, update the model, and develop an ancient and modern, energetic and open, natural ecological urban neighborhood for urban residents.

(3) Transformation and upgrading of the model base for cultural and creative industries

By transforming Cigarette Factory No.2, the environmental atmosphere and taste of life and leisure will be improved, and industries will be attracted to move in. Relying on the advantages of its geographical location, it will integrate and

develop the corresponding supporting industries demanded by the population, and finally realize the development of transformation and upgrading of cultural and creative entrepreneurship.

4. Retrofit Program

4.1. Cigarette Factory No. 2 Rehabilitation Design Concepts

The basic design concepts for the remodeling of Cigarette Factory No.2 are.

(1) Composite space. Emphasize the integration of culture, science and technology, finance and other leading industries, emphasize the catering, entertainment, leisure and other supporting functions of the composite, to meet the people based on the layout of the function, the formation of agglomeration effect[8].

(2) Growing plants, sustainable development. Enrich the ecological environment of the area and create a green low-carbon cultural park.

(3) Interdenominational integration, vibrant space. Inject the unique industrial cultural connotation of the tobacco factory to shape the city's vitality space.

(4) Reshape the “history of the factory” and inherit the history and culture. The revitalization and utilization of the unique industrial history and cultural resources of the tobacco factory.

4.2. Space Design Strategy of Cigarette Factory No.2

4.2.1. Spatial Integration - A New Spatial Development Model

Dismantle part of the old industrial buildings and insert new functional spaces into the original space to obtain a new spatial structure. Do a good job of connecting and transition space, shape selection and material application between the old and new buildings. Respect the original style and space of the building, and give the old building a new vitality. In the renovation of Cigarette Factory No.2, we have utilized the progressive structural framing system as a shared building and a plastic commercial-community complex to achieve a balance between the old industrial building and the new building according to the basic status quo.

Compared to other historical and cultural heritage, industrial heritage as a special form of heritage has a more distinctive value of material reuse, and more diversified development directions and modes. However, it also brings conflicts. In the process of transformation, some regions only consider the immediate economic benefits without considering the culture of industrial heritage and blindly and roughly transform the industrial architectural heritage, so that the industrial heritage is turned into an office or entertainment place with only a commercial atmosphere, and the historical and cultural characteristics of the industrial architectural heritage are lost[9].

4.2.2. Growing Plants - Green Ecological Environment Restoration

The regeneration of the urban industrial heritage fabric can catalyze sustainable urban regeneration if implemented through an integrated economic, social and cultural development model that resonates with policies and institutions[10]. In Zhu Qianyi and Zhu Yu's proposal for the sustainable development of the ecological transformation of

Lockport's industrial heritage[11], the strategy emphasizes the importance of ecosystem restoration. Based on this, the ecological environment strategy of Cigarette Factory No.2 is based on the basic situation of Cigarette Factory No.2, such as tight land and insufficient resources, and is oriented to sustainable development.

Based on this, the ecological strategy of Cigarette Factory No.2 is based on the basic situation of Cigarette Factory No.2, such as land constraints and lack of resources, and is oriented to sustainable development.

4.2.3. Inter-generational Integration - Cultural and Social Integration

As a public building with “inter-generational integration” as the goal of developing people's social life, Germany's “multi-generational house” has the significance and value for reference[12]. First of all, let the public space become a space for inter-generational socialization. Secondly, the overall design of activity organization is fully considered to enrich the types of scenes for residents' activities. This will attract the participation of urban residents.

The public space of “inter-generational integration” promotes inter-generational exchanges among urban residents, eases the problem of shrinking social relations, and is conducive to the physical and mental health of residents. The synergistic installation of service facilities for different age levels can save various social resources and construction costs.

4.3. Spatial Design of Cigarette Factory No.2

4.3.1. Space Integration Space

Functional spaces (as shown in Figs. 10) with industrial heritage features and historical and cultural characteristics are put into the original spatial structure, and while being rationally organized, new spatial structures are designed so that the architectural structures can be stretched and intersected to form a spatial framework of “old and new in harmony”. People can walk, stop or hold markets and performances in this area, and this transformation creates a new architectural framework that gives a cohesive central area[13].

From the perspective of spatial and temporal narratives, the unique vitality of the industrial heritage is stimulated by the spatial layout through a dialogue between the architecture and the human history of the original industrial features, and by the use of preservation and reinforcement of the historic structures [14].

Stimulate the unique vitality of industrial heritage through spatial layout. Visual elements and indicative symbols are used to show the historical lines of the factory's development, such as rising, spiraling, descending and stabilizing, to enhance the spatial feeling of the architecture of the industrial heritage, to stimulate the vitality of the industrial heritage, and to create a unique space for the integration of the regional characteristics and the historical and cultural memories of the No.2 Cigarette Factory.



Figure 8. Spatial Integration Remodeling Strategy Plan and Elevation references

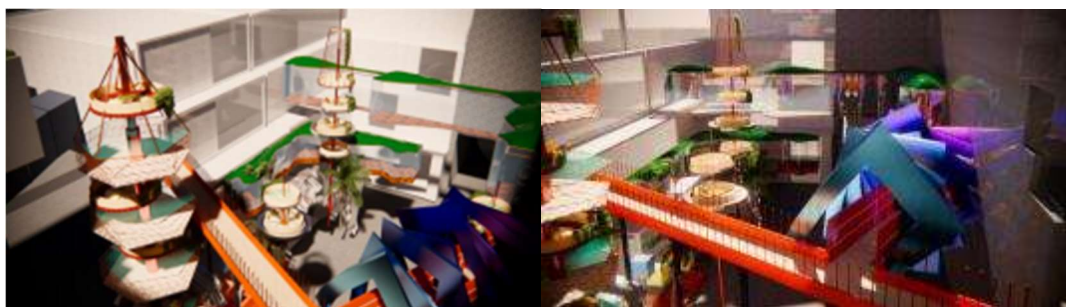


Figure 9&10. Spatial Integration Transformation Strategy Effect

4.3.2. Regenerating Spaces with Vertical Planting

In the context of sustainable urban development, it is necessary to explore the green transformation strategy to improve the comfort of urban space[15]. Combining the building form with renewable energy application, using solar photovoltaic panels, setting up stepped wild gardens on the roof[16], reducing the energy consumption of air conditioning, and adhering to the concept of green, green building materials are used in the construction.

The industrial building renovation should utilize renewable energy as much as possible, set up solar photovoltaic system to provide electricity for the buildings inside the site, and

adopt wind-solar hybrid to provide lighting energy for the site. According to the project's architectural form and the surrounding ecological environment, planting plants and adopting greening and other measures to develop the urban ecosystem. The construction of corridors, bridges and other access systems will realize the connectivity and accessibility of the outdoor environment and encourage urban residents to explore the site.

The transformation of the industrial buildings of Cigarette Factory No.2 respects its unique industrial history and cultural characteristics, and creates an inclusive and diversified spatial environment. This design strategy aims to create a sustainable urban oasis with vitality and cultural

connotations, and injects new vitality and vigor into the

transformation of Guangzhou's urban industrial heritage.

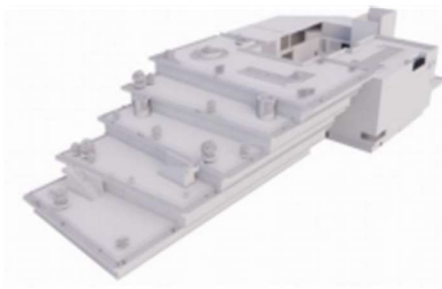


Figure 11. Architectural form



Figure 12. Stepped Wildflower Garden



Figure 13. Pendant regeneration remodeling strategy device effect



Figure 14. Spatial Integration Remodeling Strategies Installation Elements

4.3.3. Space for Intergenerational Integration

Improvement in material standards has gradually changed the way multi-generational people socialize, which has led to a lack of communication and understanding between community residents of different social backgrounds and ages, resulting in a weakening of the community's neighborly relations[17].

The social and recreational area is designed to attract the interests of all generations by creating a social + cultural

interactive space to meet the daily activity needs of multi-generational people. The space itself promotes “inter-generational integration” through environmental quality and comprehensive attraction.

“Inter-generational Integration” Multiple functions are set up for multi generational sharing. Providing a variety of services for the space creates a more harmonious atmosphere, attracting people of different generations to interact and integrate[18].



Figure 15. Inter-generational Integration Strategy Social Civic Area Design Plan



Figure 16. Inter-generational Integration Strategy Social Civic Area Design Plan



Figure 17. Inter-generational Integration Strategy Social Civic Area Rendering

5. Conclusion

Most of the industrial buildings in Guangzhou city center are rebuilt and reused by utilizing the space of old industrial factories and other buildings, which is a mode of industrial upgrading and urban renewal. Because of the wide space and low cost of industrial buildings, the industrial park is a common mode of upgrading the old industrial buildings. However, with the development of the times, the model is no longer applicable and faces the problem of remodeling. The renovation of the “Cigarette Factory No.2” can provide some reference for the redevelopment and remodeling of industrial architectural heritage.

Selection of innovative renewal models. Industrial heritage generally has a long history of development and has been built and developed by several generations, and its unique industrial history and culture has become part of the urban memory. The blind “template” renovation mode will, to a certain extent, destroy the unique environment and characteristics of industrial heritage, so it is necessary to balance the continuation of history and culture and the needs of urban construction and development in the redevelopment and reuse of industrial architectural heritage, and to realize the “integration of factory and city”. Therefore, in the redevelopment and reuse of industrial architectural heritage, it is necessary to balance the continuation of history and culture with the needs of construction and development in the

city, so as to realize “factory-city integration”.

Highlight the industrial cultural characteristics of the site. Centrally located urban industrial architectural heritage should make use of its unique industrial cultural characteristics and individual architectural space to provide people with a variety of urban supporting service functions in addition to basic functional facilities, provide diversified open space for the city, and increase the urban imprint.

Develop ecological greening and beautify urban space. Urban space is the carrier of human habitat, and the renewal and reconstruction of industrial heritage, as a part of urban space, should take into account local environmental development problems when reconstructing and utilizing it, contribute to urban greening, and integrate the spatial form into the surrounding urban environment and develop natural ecological environment.

At present, China's industrial heritage renewal and protection and utilization still have problems such as single transformation method, single function, independent spatial form, faulty cultural inheritance, unclear implementation path and uneven distribution of development rights and interests, etc. The transformation of Cigarette Factory No. 2 is a transformation of industrial heritage “planting and renewal” from the perspective of spatial narrative, and it is the first step towards the current stage of China's urban renewal and industrial upgrading. The transformation of Cigarette Factory No.2 as a spatial narrative of industrial heritage is a kind of

complementary improvement to the transformation of old factories under the current stage of urban renewal and industrial upgrading in China, and it also provides an effective reference path for the city construction to move in the direction of being more sustainable, ecologically friendly and culturally rich.

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