

Preface

Contemporary civilization faces a myriad of complex problems across various domains. Just to highlight a few:

1) **Climate Change:** Undoubtedly, one of the most pressing issues of our time, climate change threatens ecosystems, alters weather patterns, and poses profound risks to human societies. It is caused primarily by human activities, such as burning fossil fuels, deforestation, and industrial processes, leading to rising global temperatures, sea level elevations, and extreme weather events.

2) **Inequality:** Economic inequality is widening in many parts of the world, leading to disparities in income, wealth, and access to resources. This inequality can exacerbate social tensions, limit opportunities for upward mobility, and hinder economic growth.

3) **Political Polarization:** Many societies are experiencing increasing polarization and division, fueled by factors such as ideological extremism, misinformation spread through social media, and erosion of trust in institutions. This polarization can impede effective governance and lead to social unrest.

4) **Global Health Challenges:** Despite advances in medicine and public health, the world still faces significant health challenges, including pandemics (as evidenced by the COVID-19 pandemic), antimicrobial resistance, and disparities in access to healthcare between different regions and socioeconomic groups.

5) **Technology's Impact on Society:** While technology has brought about numerous benefits, it also presents challenges, such as job displacement due to automation, privacy concerns related to surveillance and data collection, and the spread of misinformation and online harassment.

6) **Human Rights Violations:** Many parts of the world continue to grapple with human rights abuses, including discrimination based on factors such as race, gender, sexual orientation, religion, or political beliefs, as well as violations of civil liberties and freedoms.

Addressing these problems requires coordinated efforts at local, national, and global levels, as well as innovative solutions that consider the interconnectedness of contemporary challenges.

In addition to all these problems, there are also country-specific problems. In Japanese society, where I currently live, the demographic challenge of an aging population and low birth rates is significant. Japanese society has one of the oldest populations globally, with a significant portion of its population aged 65 and above. The proportion of elderly individuals in Japan is steadily increasing. This demographic shift has various consequences, including increased healthcare and pension costs, labor shortages, and changes in family structures and dynamics. Moreover, Japan has been experiencing consistently low birth rates for several decades. The total fertility rate has remained well below the replacement level of 2.1 children per woman, which is necessary to maintain a stable population size in the long run. Factors contributing to low birth rates include delayed marriage, changing social norms, economic uncertainty, and challenges in balancing work and family

responsibilities.

The aging population and low birth rates pose significant economic challenges. With a shrinking workforce and increasing numbers of retirees, there are concerns about labor shortages, declining productivity, and rising dependency ratios (the ratio of dependent individuals, such as children and elderly people, to the working-age population). This can strain social welfare systems, pension funds, and health-care services, potentially leading to fiscal pressures and reduced economic growth prospects. With a shrinking working-age population, Japan faces labor shortages in various sectors, which can hinder productivity and economic competitiveness. Addressing labor market challenges often requires strategies to increase workforce participation, encourage immigration, improve labor market flexibility, and promote innovation and automation to offset demographic pressures.

Whether viewed globally or regionally, our civilization faces many problems for which easy solutions appear elusive. Confronting these “big problems” of civilizations, social activists and lay citizens have echoed a simple slogan since the 1970s: “Think globally, act locally.” However, its original optimistic spirit appears to have waned over time. While local action is valuable, some global challenges may require interventions at larger scales, such as regional, national, or international levels. Local initiatives alone may not be sufficient to address systemic issues that transcend geographic boundaries. Additionally, local action may also face challenges related to power dynamics, resource constraints, and institutional barriers. Marginalized communities or regions may have limited capacity to address issues on their own, requiring support and collaboration from external actors and institutions. The civilization that we live in has become a “monster,” which our local actions are incapable of controlling.

Nonetheless, we find ourselves compelled to embrace this slogan repeatedly. Many contemporary issues, such as climate change and public health crises, are global in nature and require coordinated efforts across borders. Thinking globally helps us understand the interconnectedness of these challenges and the need for collective action worldwide. While global thinking provides a broader perspective, acting locally allows for solutions to be tailored to specific contexts, cultures, and communities. Local action considers the unique circumstances and resources available in different regions, leading to more effective and sustainable solutions. Overall, “think globally, act locally” serves as a guiding principle for navigating the complexities of modern civilization and addressing its multifaceted challenges in a collaborative, inclusive, and contextually relevant manner. I admit that this is a mere mediocre opinion, but I have no other opinion on the current state of our civilization.

Shogo TANAKA
Director,
Institute of Civilization Research

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Toru Hattori, (School of Tourism, Tokai University)

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Research Paper

Conceptual and ideological study on society's environmental awareness regarding water resources

Yoichi HIRANO¹, Takuo NAKASHIMA², Mitsutoshi YAHARA³, Toru HATTORI⁴,

Mina ADACHI¹, Hota MORIYA⁵

Abstract

Institute of Civilization Research, Tokai University has been exploring the relationship between quality of life (QOL) and the environment. This idea is based on a dual perspective: improving people's QOL and fostering environmental awareness. The latter comprises cultural, social, and natural environments, with the natural environment being particularly essential. This study focuses on the water environment, which is one of the most important elements not only for agriculture but also for sustaining human life. To what extent, then, can people consider their own water environment as a social element for life satisfaction? This study applies the concept of Social Capital to develop a conceptual and ideological discussion, delving into the sociological aspects of fostering awareness regarding water resource conservation.

Keywords: Environment-related QOL (e-QOL), Human awareness of water resources, Local consciousness, Placeness, Social capital

1. Preamble

The world is currently facing various crises, including misunderstandings and conflicts between people caused by differences in religion and ideology. However, one of the most pressing global challenges facing humanity is the environmental issue. In 2021, the 6th Assessment Report of the Intergovernmental Panel on Climate Change declared that the current climate change, represented by global warming, is caused by human activities (The 6th Assessment Report of IPCC, Aug. 6, 2021)⁶. Carbon dioxide (CO₂) emissions by human activities are gradually choking humans themselves and pushing the global environment toward collapse.

The Institute of Civilization Research of Tokai University has been exploring environmental issues as a part of our core project, examining the relationship between the environment and human quality of life (QOL)⁷. In 2023, we renewed our previous research and launched a study on "Humanities under the Anthropocene." The "Anthropocene" proposed by Paul Crutzen in 2000 shocked the world in some way. The "Anthropocene" signifies a geological epoch shaped by human activities. Thus, it reveals the features that humans have carved in opposition to the system of nature. In 2009, Rockström's team has proposed "planetary boundaries," which reported serious changes in the Earth's natural environment. This continues to report the situation of the natural environment to these days and to alert us to the profound impact

¹ Institute of Civilization Research, Tokai University

² Secure Cycle Inc.

³ School of Humanities and Science, Tokai University

⁴ School of Tourism, Tokai University

⁵ Graduate School of Letters, Tokai University (Master's degree student)

⁶ *Climate Change 2021: The Physical Science Basis*

URL: <https://www.ipcc.ch/report/sixth-assessment-report-working-group-i/> (accessed on Nov. 2023)

⁷ Hirano & Nakashima (2017), Nakashima & Hirano (2018, 2019), Hirano, Nakashima, Hattori, Takatori & Adachi (2022).

humans have had and continue to have on the Earth's ecosystem.

As to these environmental issues, our research group gave a poster presentation on the “water environment surrounding human societies” from a humanities and sociological perspective at the Asian Agricultural Symposium held in December 2023⁸. Maintaining the water environment is an essential issue for humans. In this paper, based on the content of the poster presentation, we will discuss the significance of water in the local environment by introducing the notion of “social capital” related to the maintenance and the conservation of water resources. Here, we try to develop a conceptual and ideological perspective (related to human value consciousness).

2. Background of the Study

It goes without saying that human society is supported by water. Water is essential for our survival and likewise nurtures life on the Earth, i.e., nature, including life, is protected by water (Figure 1). For instance, when we consider agriculture (including livestock farming in a broad sense), it is an essential industry for humans to sustainably obtain food. In other words, it is an “industry that nurtures life” in the following two senses: (1) it provides sustenance for humans, and (2) it sustains natural life, including humans. Furthermore, it should be noticed that itself is supported by water. This discussion is not limited to general considerations from a macroscopic perspective. Rather, historically and traditionally, whenever people in each region, confronting nature, engage in their activities, they have sought to coexist with nature. One of the important elements in nature is water. Therefore, water can be considered a vital element that sustains both the local ecosystem and the activities of the residents in the area.

When addressing the water environment, it is imperative to adopt a comprehensive perspective. Water issues hold significant importance within the sustainable development goals (SDGs) proposed by the United Nations⁹. The SDGs, encapsulating the principle of “No one will be left behind,” prominently address water-related issues. It is because various water-related issues are occurring on a global scale. In fact, Goal 6 of the SDGs raises “problems with hygiene, such as securing clean drinking water and toilets.” Considering this situation, it is certain that the water environment involves not only productive activities such as agriculture but also a wide range of issues related to human survival. Therefore, the examination of people's perceptions toward water, both individually and collectively, emerges as a topic warranting careful deliberation.

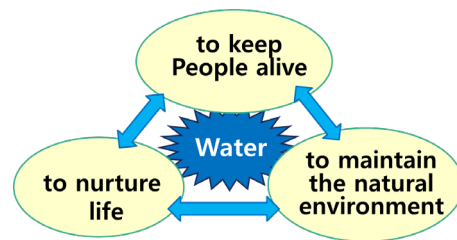


Fig. 1 Importance of Water

3. A Warning from Planetary Boundaries Regarding the Current State of the Global Environment

After Crutzen proposed the Anthropocene, in 2009, Rockstrom of the Stockholm Resilience Centre

⁸ Hirano, Nakashima, Yahara, Hattori, Adachi, Moriya, “Conceptual and ideological study on society's environmental awareness regarding water resources,” The 19th Asian Agricultural Symposium, 2023, held in Kumamoto, Dec. 2, 2023.

⁹ Homepage of the United Nation, “Department of Economic and Social Affairs, Sustainable Development,” URL: <https://sdgs.un.org/goals> (accessed on Nov. 2023)

announced a report on the current state of the global environment, i.e., “planetary boundaries.” The current study examines the global environment using nine fields as indicators and indicates whether each field has been inhibited beyond the threshold of irreversible crisis. Figure 2-A and 2-B show the situation of the global environment, comparing the differences between 2009 and 2023¹⁰.

The data show the changes in the water environment on a global scale. In 2009, freshwater pollution and depletion thresholds were not exceeded, suggesting a relatively stable situation within safe parameters. However, it can be seen that the situation in 2023 will exceed the safe range and gradually become a serious situation.

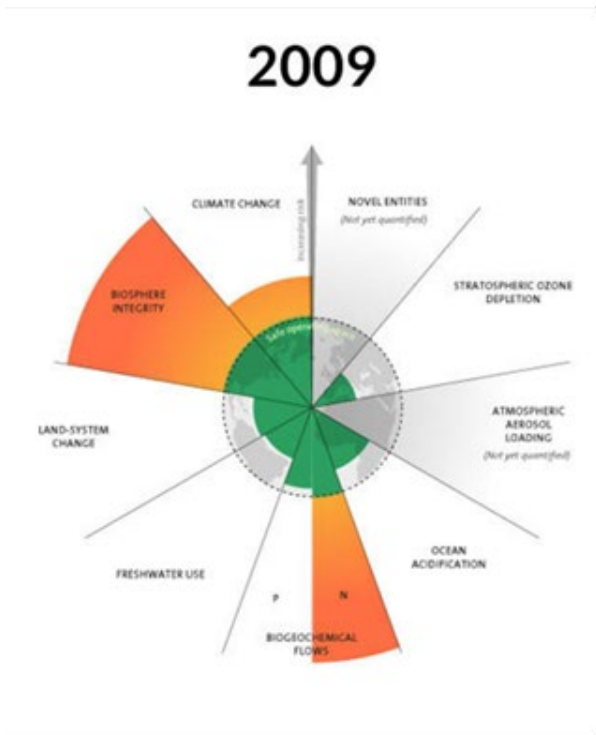


Fig. 2-A. Global State in 2009

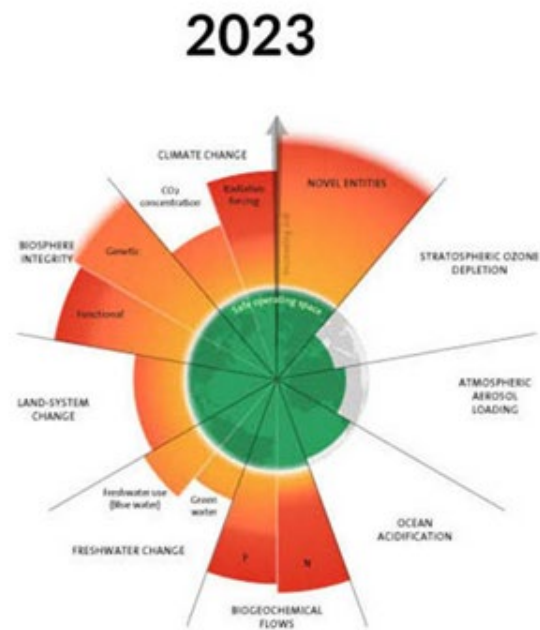


Fig. 2-B. Global State in 2023

In particular, planetary boundaries currently introduce blue water and green water as freshwater indicators. Blue water refers to water found in rivers, lakes, and groundwater that can be used for human daily life and agriculture (domestic water, industrial water, etc.). Conversely, green water refers to water contained in plants, soils, etc., that can be used for agriculture and food production. These water environments have deteriorated considerably over the past 15 years. Regarding blue water, problems with nitrogen fertilizers in agricultural production are increasing globally, including isolated freshwater bodies that do not flow into the ocean. The same holds true for green water; for instance, it has been affirmed that forests are losing soil moisture due to climate change and deforestation, such as water shortage in the Amazon region.

To summarize the warnings of the planetary boundaries, the following problems have been highlighted:

¹⁰ Homepage of Stockholm Resilience Center.
 URL: <https://www.stockholmresilience.org/research/planetary-boundaries.html> (accessed on Nov. 2023)

- Many rivers still remain in a poor ecological condition ⇒ due to high levels of fertilizer nutrients and other pollutants (also to domestic wastewater).
- Decrease in water storage in cities (lack of parks, green spaces, etc.) => rapid runoff of rainwater, etc., from urban areas.
- Need for hydrological balance among forests, soil, and landscape ⇒ reconsider water resources and create wise usage methods.

4. Direction of Future Research

Regarding the current state of the water environment, the following directions can be considered from a conceptual and ideological perspective (Figure 3).

- 1) How do we consider water resources in the space (placeness) that humans envision for the natural environment?
- 2) How does the society to which an individual belongs build water resources as one of her social capital?

Regarding these two points, the present study introduces and examines the concepts of “placeness” and “social capital”.

(1) Placeness

The basic attitude toward environmental issues is the relationship between the environment and humans in each region, and this relationship is called “placeness”¹¹. Here, the concept of “placeness” is defined as follows¹². It is a sphere where people interact with nature, imbuing it with meaning, while their activities and lifestyles (including

their livelihoods) are positioned within its confines. Therefore, in each region, we can clarify how people have been involved with the water environment (and how they still do so) as their sense of value toward water. Through this lens, we can clarify the importance of water resources for each position.

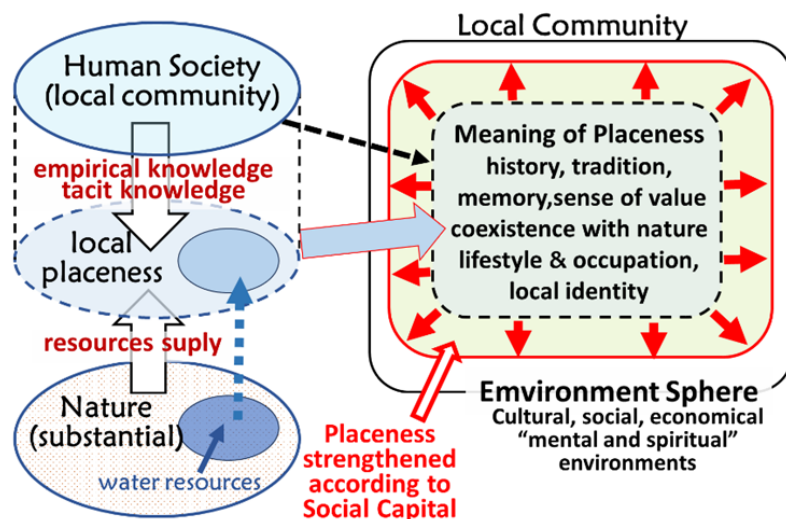


Fig. 3. Relation between Local Society and Nature

¹¹ Hirano, Nakashima, Hattori, Adachi (2022)

¹² Initially, the concept of “placeness” was introduced by Edward Relph, and this paper also owes its foundation to his idea. E. Relph, *Place and Placelessness*, Pion, 1976.

(2) Social Capital

Social capital has been studied in various ways¹³, but here we will basically follow Putnam’s argument. In other words, it is a concept that aims to improve the efficiency of society by activating harmonious activities among people in a certain community (society) and refers to the characteristics of social organizations, such as trust, norms, and networks (Figure 4). “Social trust in complex modern settings can arise from two related sources — norms of reciprocity and networks of civic engagement,” said Putnam¹⁴.

In addition to the two concepts, it is also important to consider whether people can share their awareness of water resources. Social capital is a concept (a kind of indicator) for forming social organizations that promote mutual solidarity. Here, as to social capital, “physical capital” and “human capital” are important. “Physical capital” means physical equipment, such as securing and supplying water resources, and “human capital” refers to people’s knowledge about water. This paper also focuses on people’s spirituality — their shared awareness of the water environment. Although such spirituality can be considered to be included in “human capital,” we will spontaneously introduce another type of capital, which is defined as “mental capital” or “spiritual capital.”¹⁵ This capital can signify an idea to measure the level of mental satisfaction people obtain from retaining water resources when “physical capital” and “human capital” are enriched. Therefore, such capital is closely related to the “placeness” mentioned above.

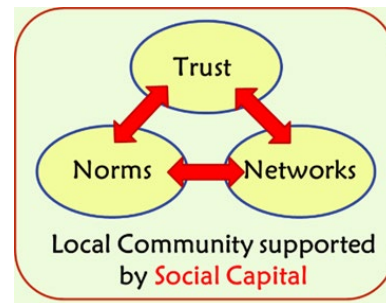


Fig. 4. Structure for Social Capital

5. Some Preliminary Results

Regarding the consideration of water resources, we will introduce some examples obtained based on the abovementioned “placeness” and “social capital.”

(1) Case study 1: Environment-related questionnaire for young people in Kumamoto Prefecture¹⁶.

In a QOL-related survey of young people in their 20s in Kumamoto Prefecture, respondents said that the environmental element they were most interested in relation to their QOL was “water” (Table 1). This is thought to have a lot to do with the fact that Kumamoto Prefecture is called the “City of Water.” In other words, it can be considered that local people’s awareness of valuing water is arousing interest in the water environment among young people.

(2) Case study 2: Policies regarding water resources in Zama City, Kanagawa Prefecture.

Water resources in this region depend on groundwater and extra-regional water sources. Therefore, maintaining valuable water resources is an important issue for the region. The local government has

¹³ Discussions regarding “social capital” stem from Marcel Mauss’s gift theory (particularly the norm of reciprocity), which arose from the “analysis of exchange systems” in cultural anthropology and Pierre Bourdieu’s habitus theory.
¹⁴ R. Putnam, *Making Democracy Work: Civic Traditions in Modern Italy*, Princeton University Press, 1993, p.171.
¹⁵ The “mental capital” mentioned here was introduced and discussed in a graduate school class organized by Hirano, with two graduate students, namely, Moriya and M. Pengsom.
¹⁶ Hirano, Nakashima, Takahashi, Hattori, Adachi (2022)

created a map of spring water in the area and is promoting the importance of protecting the environment, including forests. At the same time, the local government is campaigning to raise awareness of the effective use of water and the reduction of pollution.

6. Future Perspective

Water resources are essential for human survival, including human life and agricultural activities. Therefore, maintaining healthy water resources is an important issue. In this paper, we proposed future directions for fostering people's awareness of water resources when considering the water environment from the perspective of regional "placeness" and "social capital." In fact, the following points are found important for future measures regarding water resources:

- Appropriate limits on water usage,
- Reuse of domestic and industrial wastewater,
- Development of urban water storage facilities,
- Development of renewable and sustainable water supply systems.

When considering these points, there is no doubt that infrastructure development — securing and maintaining "physical capital" referred to as social capital — is important, but what is even more important is people's awareness, i.e., "mental capital." What is particularly important for environmental issues is that people take steps to preserve the environment of their own volition. It is because there are concerns about sustainability if people try to push themselves too hard and hold back to preserve the environment. In this sense, sustainability means that local people preserve their water environment while maintaining their historical traditions and lifestyle habits while maintaining their satisfaction with life. Currently, several surveys of people's happiness levels are being conducted¹⁷, and in the future, it will be necessary to consider the direction of water environment maintenance while also focusing on such data.

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¹⁷ Moriya, one of the authors, is conducting joint research using data from Daito Trust Construction Co., Ltd. JAPAN ("Town Livability Ranking 2023").

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Research Paper

Role of Social Capital in Sustaining Tourism Activities

Soji LEE¹

Abstract

Sustainable tourism should be considered from the environmental, social, and economic perspectives. Social capital is formed through mutual trust and cooperation among people and is an important element in tourism activities. This study focused on the interaction between social capital and tourism activities and examined the relationship between social capital and Japanese culture. As a result, the following was observed. First, social capital promotes trust and cooperation among stakeholders in tourism activities and contributes to building sustainable cooperative relationships. Second, social capital helps protect local culture and the environment to promote sustainable tourism activities. Third, the inheritance of Japanese culture by local communities can lead to the revitalization of tourism activities. We also classified local communities according to bonding and bridging types of social capital and examined their characteristics. The results indicated that the bonding type has strong ties within the region, but the bridging type has stronger ties with cities with contacts outside the region. We believe that these findings will be useful for tourism planners and local community stakeholders in reconsidering the prospects for sustainable tourism.

Keywords: Social capital, Sustainability, Tourism, Community, Japanese culture.

1. Introduction

Sustainable tourism needs to be considered from the environmental, social, and economic perspectives. It requires the maintenance of natural resources, such as in the protection of ecosystems, taking into account the preservation of local culture, history, and communities. In sustainable tourism, tourists must recognize and respect local culture and traditions. As a result, the charm of the region will be exposed, which will also lead to economic development. The United Nations World Tourism Organization (UNWTO) indicates that sustainable tourism development requires “Tourism that takes full account of its current and future economic, social and environmental impacts, addressing the needs of visitors, the industry, the environment and host communities” (UNWTO, 2023). Thus, the social environment for tourists and the existence and the significance of communities for residents are for sustainable tourism. Regarding the cultural aspects of a community, UNWTO calls on authorities to “Respect the socio-cultural authenticity of host communities, conserve their built and living cultural heritage and traditional values, and contribute to inter-cultural understanding and tolerance.” The existence of communities is related to the preservation of cultural values, and it contributes to cross-cultural understanding. In tourism, the existence of communities within local communities should be noted, along with the fact that unique social and cultural norms are built from the relationships of mutual trust within these communities. As a derivative of this important fact, social norms are preserved to this day, and continuing cultural and traditional values remain a major attraction for tourism. This paradigm-building and unique form of tourism aimed at sustainability is called community-based tourism (CBT). CBT is developed to strengthen social ties through local

¹ School of International Cultural Relations, Tokai University.

communities while promoting sustainable economic growth through tourism.

This study focuses on the concept of social capital and explores the sustainability in tourism and Japanese cultural values with respect to that perspective. Social capital is formed through mutual trust and cooperation among people and is an important element in tourism activities. We here consider the norms and values of Japanese culture that were created by the local community..

2. Relationship between social capital and tourism

2.1 Basic theories and concepts of social capital

The starting point for the concept of social capital is Coleman (1998), who provides a detailed account of the relationship between social capital and human capital. That is, social capital is derived from relationships of trust, collaboration, and mutual benefit formed in the interactions among and networks of people and groups. This concept refers to the degree of trust and cooperation that is shared by a range of individuals and social groups, and its existence influences the functionality and sustainability of organizations and communities (Putnam 1993; Coleman 1988). According to Putnam (1993), social capital consists of “norms based on trust, networks, and mutual benefit,” and these shared elements create cohesiveness throughout society. By contrast, Coleman (1988) defines social capital as “resources that are shared in the process of forming individual capital (human capital)” and considers it to influence individual behavior, organizational functioning, and states. Social capital can change across different cultural backgrounds and social environments, and relationships within local communities and organizations influence its formation.

2.2 Relevance to tourism activities

This study focuses on the importance of social capital and its impact on tourism activities, with particular regard to its interaction with Japanese cultural values. In tourism, social capital promotes trust and cooperation among different stakeholders and contributes to building sustainable cooperative relationships. This makes it easier for tourism operators, residents, tourists, etc. to pursue common goals, leading to successful tourism activities (Fukuyama 1995; Woolcock & Narayan 2000). Additionally, when social capital exists in tourism activities, regions and communities tend to respond flexibly to changing conditions. Appropriate social networks can support sustainable tourism activities in a region and contribute to environmental and cultural conservation (Putnam 1993; Woolcock & Narayan 2000). Japan’s unique cultural values and its social capital interact with each other. When local traditions and cultures of hospitality are strengthened through social capital, tourism experiences can become rich and sustainable. Conversely, tourism activities can increase the social capital of local communities and contribute to the inheritance and development of culture. Thus, social capital and tourism have a mutually complementary relationship. The social networks that are formed through tourism become capital for the entire community and increase the attractiveness of the area. Through comprehensive analysis of these factors, we can identify the impact of social capital on the sustainability of tourism activities and its relationship to the values of Japanese culture, providing a more insightful perspective on tourism.

2.3 Community-based tourism

CBT can be developed to support sustainable tourism. CBT strengthens social ties in local communities while promoting sustainable economic growth through tourism. In CBT, local communities actively and

independently participate in tourism and to provide local culture and resources. At the UNWTO Global Summit on Community-based Tourism, held in 2022 (UNWTO, 2022), discussions revolved around the contribution that community-based tourism made to the attainment of the Sustainable Development Goals. The summit delved into the challenges and opportunities associated with tourism, taking into account the perspectives of various stakeholders throughout the tourism value chain. Mochizuki (2020) investigated destination tourism initiatives across three communities in Japan: Wazuka in Kyoto, Toba in Mie, and Onomichi in Hiroshima. Land-based tourism incorporates elements of CBT, in that it places value on deep interactions between tourists and residents. In the same way that destination-based tourism makes effective use of local culture, nature, and history, CBT achieves sustainability through protecting and nurturing common regional assets. Yamamura and Ishikawa (2012) empirically investigated the role that small-scale accommodation facilities in Hokkaido play in promoting local community-based tourism. In particular, we conduct a comparative analysis of guesthouses in rural areas and in urban areas, examining local independence in the use of local resources and in planning and operating tours.

3. Local community and tourism activities

3.1 Tourism activities based on Japanese culture

Local communities help support and pass on the unique culture of a region, including its traditional performing arts, festivals, and local cuisine (Sasaki 2022; Takahashi 2019; Nakamura, et al. 2018). These cultures are attractive tourist resources, and their inheritance by local communities can also lead to the revitalization of tourism. Tourism is an important category of economic activities, leading to the revitalization of local communities. Accepting tourists and providing services for them can lead to increased employment and incomes for members of local communities. In addition, through interaction with tourists, the awareness and values of local community residents may change, leading to the revitalization of the local community. Thus, local communities, Japanese culture, and tourism are closely interrelated. The inheritance of Japanese culture by local communities leads to the revitalization of tourism activities, which in turn leads to the revitalization of local communities in a virtuous cycle. Specific examples include Kyoto's Gion Festival and Autumn Festival, Okinawa's Eisa, and Hokkaido's Snow Festival, where traditional performing arts and festivals that are mainly passed down by local communities attract many tourists from all over the world. These are important tourist resources. In addition, local community-run guesthouses, hot spring inns, and farmhouses provide tourists with opportunities to experience local food and culture.

3.2. Classification of local communities

Local communities are classified according to their bonding and bridging types of social capital and the scales of their networks. Here, we consider the Hokkaido area as an example. Bonded social capital is understood with reference to strong and close-knit communities within the region. The residents share a common culture, language, or history and have close relationships with each other.

An example of a bonding-type local community in the Hokkaido area is the occurrence of collaboration between local industry and residents. An example of this is detailed below. For example, in Furano City, residents link agriculture and tourism by taking advantage of the natural resources of the seasonal scenery. Events are held locally, such as the Biei Town Agricultural Harvest Festival, and the

tourism industry and residents collaborate. In such areas, residents work together toward common goals, taking pride in local resources and culture and fostering a sense of solidarity through local industries such as tourism and agriculture. Local community bonding is deepened through events and projects where both tourists and residents can participate. Alternatively, an example of a bridging-type regional community in the Hokkaido region is the collaboration between the region, tourism companies, and local businesses in Sapporo City. Sapporo is the capital and largest city of Hokkaido and has a thriving tourism industry. Residents, tourism operators, and local businesses are working together to develop the city. Tourism operators and local businesses work with residents to provide local products and services. Local restaurants, art galleries, craft stores, and more work together to offer tourists various experiences and products. In addition, in Sapporo, residents, tourism operators, and local businesses are working together to promote regional development projects. For example, historic areas of the city are being redeveloped, and tourist attractions are being renovated. In addition, residents, tourism operators, and local businesses are jointly organizing events and festivals. This creates a lively local atmosphere and supports the tourism industry throughout the region. In these areas, there is strong cooperation among tourism operators, local businesses, and residents to develop the entire area and create attractive local communities where diversity is respected. Thus, the bonding type is developing in rural areas, and the bridging type is developing in cities.

3.3 Relationship with culture in Hokkaido

Using Hokkaido as an example, we examine how the inheritance of Japanese culture by local communities can lead to the revitalization of tourism activities. In particular, traditional festivals and events, crafts, cuisine, music, and historical buildings are linked to the revitalization of tourism. A prime example of a traditional festival is the Sapporo Snow Festival. The snow festival, held in Sapporo every February, is very popular with tourists, with snow and ice sculpture displays, light displays, food stalls, live music, and more. A second example is the Tokachi Okhotsk Drift Ice Festival. Tourists enjoy snowmobiling on the ice, ice cafes, and drift ice cruises. In addition, for crafts, woodworking including carved wooden bears, deer, foxes, and other animal figurines, tableware, and furniture are popular tourist souvenirs. In addition, Japanese paper crafts, such as lampshades, posters, and letter sets made with washi paper are sold at tourist spots. Furthermore, folk songs reflect the history and climate of the region. These elements are incorporated into Hokkaido's tourism activities, and sustainable tourism is realized through the cooperation of local communities.

4. Conclusion

In this study, we investigated the link between sustainable tourism and social capital, in particular its interaction with Japanese culture. Sustainable tourism requires a three-pronged approach: environmental, social, and economic. Social capital supports tourism activities through trust and collaboration among stakeholders, and it interacts in particular with Japanese cultural values. In addition, CBT is attracting attention as a method of involving local communities in tourism and promoting sustainable development and social ties. The inheritance of Japanese culture by local communities has revitalized tourism, and the opposite is true as well, creating a virtuous cycle. When social capital is classified into bonding and bridging types, the bonding type is seen to have developed outside of cities, whereas the bridging type is

more prominent in them. We consider that these findings are useful for tourism planners and stakeholders in local communities for reconsidering the prospects for sustainable tourism.

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Research Paper

A Study on Acceptance of Social Capital in Japan

Hota MORIYA¹

Abstract

In recent years, there has been a burgeoning interest in social capital both on the global stage and within Japan. Its utility has been increasingly underscored, with international organizations as well as Japanese ministries and agencies recognizing it as an effective tool for addressing various social challenges. Nevertheless, social capital remains relatively unfamiliar to the public, and there are differences in comprehension across different segments of society. This knowledge gap impedes a smooth understanding of social capital. This paper aims to review the various interpretations of social capital within different Japanese government offices, provide a comprehensive overview of the concept, and discuss the efficacy of social capital in solving social problems.

Keywords: social capital, social communication, people's happiness.

1. Introduction

(1) Background

In recent years, the Japanese government has increasingly prioritized the concept of social capital across various ministries and agencies as a means to address various social problems. According to the Cabinet Office, "It has been suggested that areas with declining vitality in terms of population have relatively rich social capital, and in areas with rich social capital, this may contribute to the social growth of the population or the control of social decline" (Cabinet Office, 2016).² This perspective is supported by empirical administrative views underscoring the effectiveness of social capital initiatives. The 2021 white paper on the environment, focusing on a healthy material cycle society and biodiversity, issued by the Ministry of Environment, states following:

"A decline in the population of rural areas may dilute the bonds between people in rural areas and make it difficult to form social capital. To solve this problem, information and communication technology will be used to connect people, goods, organizations, and people within and outside the region, in other words, to promote partnerships."³

Other Japanese ministries have also emphasized the significance of social capital. For instance, the Ministry of Agriculture, Forestry and Fisheries (MAFF) highlights the importance of "the maintenance and revitalization of social ties and rich human relationships in rural areas, accompanied by trust and norms in keeping with the times and circumstances, will serve as a foundation for the revitalization of rural areas beyond the agricultural sector" (MAFF, 2007).⁴ Additionally, a study group of the National

¹ Graduate School of Letters, Tokai University (Master's degree student).

² Homepage of the Japanese Cabinet Office 「ソーシャル・キャピタルの豊かさを生かした地域活性化」
URL: <https://www.esri.cao.go.jp/jp/esri/prj/hou/hou075/hou75.pdf> (accessed on Jan. 26, 2024)

³ Homepage of the Japanese Ministry of Environment 「新時代の地域づくりハンドブック～自立分散でつながりあう地域を目指すデジタル活用とパートナーシップ～」
URL: <https://www.env.go.jp/content/000060794.pdf> (accessed on Jan. 26, 2024)

⁴ Homepage of the Japanese Ministry of Agriculture, Forestry and Fisheries 「『農村のソーシャル・キャピタル』～豊か

Institute for Land and Infrastructure Management, the internal think tank of the Ministry of Land, Infrastructure, Transport and Tourism, recognizes the contribution of social capital contributes in addressing societal challenges, as evident in the Saitama Prefecture Model Project for the Promotion of Recidivism Prevention Effectiveness Verification Conference.

Furthermore, there have been reports on the relationship between social capital and crime in society. The Ministry of Justice cited poor social capital as a characteristic of offenders, stating that “they have poor connections with others, discordant family relationships, lack of trusted friends, and become isolated because there are no people or institutions with whom they can consult.” Numerous analyses suggest a correlation between low social capital and crime.

The statements highlight the positive stance of Japanese ministries toward social capital and their high expectations for its fulfillment. The decline of social capital is recognized as posing risks to national interests within various ministry domains. Moreover, social capital has garnered international attention as a means to enhance social life and prevent community decline. The United Nations, in particular, has initiated efforts such as the World Social Capital Monitor to promote and stimulate social capital globally, recognizing its significance in achieving the Sustainable Development Goals (SDGs) (United Nations,2022). As part of SDG Action, the United Nations is also working on quantifying social capital, believing that such quantification will be instrumental in achieving the SDGs.

(2) Research questions

Meanwhile, does the public have any interest in the aforementioned government proposals, regardless of the actual progress made in implementing these measures? Do they perceive any changes that could be attributed to social capital? The reality is that we do not observe significant changes in our society. This may be due to the insufficient organization and promotion of the concept of social capital. Although the term “social capital” is frequently used, emphasis is placed solely on its merits.

In response to this trend, this paper revisits the concept of social capital and explores its potential application in analytical surveys of Japanese society. Specifically, it examines how social capital should align with various factors that determine the target community and the reciprocal relationship between social capital and these factors. Failure to specify the type of social capital under examination risks diluting the purpose of the study, leading to overuse of the term without clear delineation.

Considering such situations carefully, we examine the significance of social capital in analyzing local communities, especially in the context of network formation among individuals. By clarifying how the accumulation of social capital benefits society and how it contributes to community promotion, we aim to provide clarity on the significance of social capital in fostering community cohesion. Additionally, we explore the importance of social capital in examining local communities, particularly in studying network formation among individuals. Building upon this research, we will explore the practical application of the concept of social capital in today’s society, characterized by passive tendencies and individualization toward local communities and related activities.⁵

な人間関係の維持・再生に向けて〜」

URL: <https://www.maff.go.jp/j/nousin/noukei/socialcapital/pdf/data02.pdf> (accessed on Jan. 24, 2024)

⁵ The author’s main research focuses on the relationship between Social Capital and “Town Livability” (as it should be); see the last section of this paper for more details.

2. Basic principles of the Concept of Social Capital

Social capital, a term relatively unfamiliar in Japan, is often understood as a form of societal capital. Bourdieu identified economic, cultural, and social capital as the three primary types of capital. However, in the Japanese context, “social capital” is sometimes conflated with “physical infrastructure,” necessitating the inclusion of the element of “human relationship capital.” In this paper, we adopt the term “social relationship capital” to underscore our focus on human relationships within a dynamic society, rather than solely on individual interpersonal connections.

An essential aspect to consider is the interpretation of “society” in this context. Without defining the parameters of attributes such as “which society” and the extent of community boundaries, specifying the essence of social capital becomes challenging. To cite a few definitions of social capital, Robert Putnam, a prominent figure in discussions of social capital in sociology and political science, defines it as “the characteristics of social organizations, such as ‘trust,’ ‘norms,’ and ‘networks,’ that can enhance the efficiency of society by stimulating cooperative behavior among people” (Putnam, 1993)⁶.

Similarly, the Organization for Economic Cooperation and Development describes it as “a network of shared norms, values, and understandings that facilitate cooperation within and between groups.” Conversely, the Japanese Cabinet Office defines it as “social ties or rich human relationships underpinned by trust.” Despite minor discrepancies, the fundamental perception of social capital remains consistent among researchers and institutions. However, variations exist in the specific structural components of social capital scales across different research fields or objectives, such as medical care and welfare, politics, and agriculture. Efforts are underway to measure social capital by further subdividing its basic components, namely “trust,” “norms,” and “networks,” and scaling their associated elements for each research field and objective. Nevertheless, caution is warranted when applying measures from one setting to another, given variations in environmental factors, including the constituents against whom social capital is modeled and the groups and boundaries within which it operates.

3. Applying social capital in Japan

In this paper, given our focus on the regional and community levels in Japan, it is impractical to treat the social capital metrics used national-level assessments in the same manner. The key consideration is not in whether the survey is large or small, but in the ability of the social capital concept used to capture the community’s nuances comprehensively. The difference in approaches between national citizens and community residents precludes identical treatment of “national” and “community” relationships and administrations. This is because when the content is collected at the regional level, a deeper relationship and attachment can be expected.

Moreover, even when evaluating the strength of connections within a group, it is essential to recognize that social capital observed in dictatorships or former communist countries often stems from state-enforced circumstances, rather than individual choice. Such environments should be characterized by “an atmosphere in which one cannot touch anyone outside at all,” under “restrictions on relocation” and other nonvoluntary environments. The resulting social capital lacks the foundation of freedom of

⁶ R. Putnam, *Making Democracy Work: Civic Traditions in Modern Italy*, Princeton University Press, 1993, p.167.

choice.

Similarly, when analyzing local communities in Japan, it is crucial to acknowledge that social capital is high due to the intimacy of the traditional village societies, which are characterized by closed relationships and forced participation in community activities as well as marginalization of those who deviate from the norms of the community. However, this situation, known as “bound social capital,” does not embody the freedom of individual choice. Instead, this paper focuses on “freedom-type social capital,” which refers to and enhances social capital in a community environment that is constructive rather than coercive, where members build and maintain a spirit of mutual support, and where members can voluntarily withdraw from the community. To cultivate a spirit of mutual aid backed by trust, it is necessary to foster mental or spiritual capital within social networks.⁷

4. Examples of social capital expected in Japanese communities

Here, we examine specific examples of social situations in Japan where improvements can be expected by strengthening social capital. A notable example of this is the solitary deaths among the elderly population (65 years and older), which is increasingly prevalent in Japan (refer to Fig. 1).

In the “2010 white paper on the aging society,” the Cabinet Office states the following:

“Tragic lonely deaths that are left unattended for a long time after death undermine human dignity and cause psychological impact and economic burden to the deceased’s relatives, neighbors, and landlords.” (Cabinet Office, 2010)⁸

The white paper does not only address the visible challenges associated with body decomposition and cleanup procedures; it also underscores the psychological impact on individuals. The loss of dignity and emotional toll on others due to such deaths is a fate that individuals themselves would prefer to avoid.

Solitary death refers to death that occurs without the presence or notice of others for a period. This suggests that the individual was often in a state of

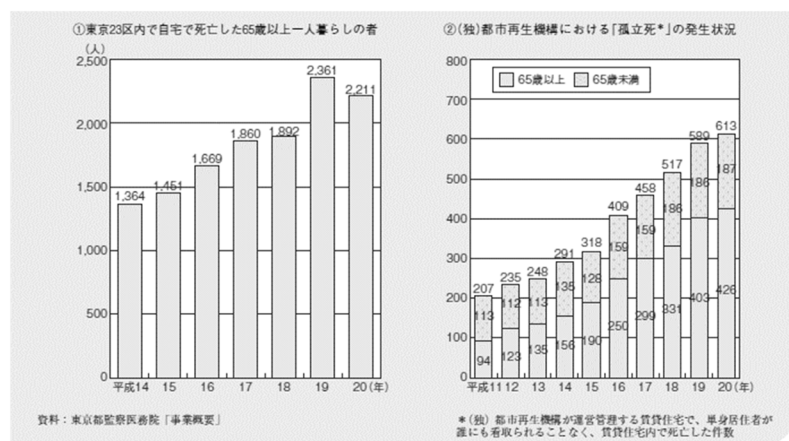


Fig. 1. Change in elders' solitary death
(2010 White Paper of the Japanese Cabinet Office)

⁷ The “mental capital” (or “spiritual capital”) mentioned here was introduced and discussed in a graduate school class organized by Hirano and the author.

⁸ Homepage of the Japanese Cabinet Office, White Paper on Aging Society 2010
URL: <https://www8.cao.go.jp/kourei/whitepaper/w-2010/zenbun/html/s1-3-3-02.html> (accessed on Jan. 26, 2024)

isolation prior to their demise. In Japan, this situation is on the rise (Fig. 1).⁹ However, the dissemination of the concept of social integration can be developed to avert such solitary deaths. By promoting interaction and vigilant monitoring among residents, the incidence of lonely deaths can be mitigated.

Beyond addressing the solitary deaths of the elderly, the cultivation of social capital enhances people's lives, particularly in disaster-prone Japan. The country frequently grapples with severe disasters that paralyze public institutions, making community-based social networks critical for survival and mutual aid. The effectiveness of social capital in emergencies has been shown extensively, not only in disaster prevention and countermeasures right after a disaster but also throughout the entire process.

For example, the "Iwanuma Project,"¹⁰ a collaborative effort between Iwanuma City in Miyagi Prefecture and Harvard University, commenced in August 2010, to fortify community resilience against disasters. Initiated just before the Great East Japan Earthquake on March 11, 2011, the project has continued after the disaster, offering valuable insights. According to research conducted before and after the earthquake, "the mortality rate (12.8%) on the day of the earthquake for the 39 people who had suffered from severe depression requiring nursing care before the disaster was four times higher than for those without depression" (Nikkei BP Research Institute, 2022)¹¹. The data suggest that those who were not "depressed" had significantly higher survivability at the time of the disaster.

Furthermore, this article highlights the importance of social capital:

"If a person had someone who listened to their worries and complaints before the disaster or took care of them when they were sick in bed, the risk of 'depression' after the disaster was 30% lower than if they did not have such a person.... It has been shown that enriching social capital during normal times, before and after the disaster, as a 'soft' disaster prevention measure, is effective in alleviating postdisaster 'depression' and other health problems (e.g., PTSD [post-traumatic stress disorder], dementia, sleep disorders, etc.)."¹²

The enrichment of social capital predisaster significantly alleviates ongoing physical and mental stress postdisaster. The Iwanuma project data shows that "not being depressed greatly improves survivability, and a high level of social capital reduces the risk of depression. In other words, higher social capital can be considered equivalent to "higher survivability."

5. Discussion on the efficiency of social capital

Despite the documented efficiency of social, there are criticisms aimed at the concept itself. These criticisms revolve around the perception of social capital as fostering closed relationships akin to those found in traditional "village societies," wherein group ties can sometimes impede individual freedom. The idea suggests that individuals who fail to integrate into such circles, those who deviate from societal norms,

⁹ *Ibid.*

¹⁰ Homepage of the Japanese gerontological evaluation research, *Iwanuma Project: Social capital and functional recovery of older adults after the Great East Japan Earthquake and Tsunami*, URL: https://www.jages.net/project/jititaijointresearch/iwanuma/?action=common_download_main&upload_id=15260 (accessed on Jan. 30, 2024)

¹¹ Nikkei Business, 「第8回 ソーシャル・キャピタルを「見える化」、災害に強く健康なまちをつくる」 URL: <https://project.nikkeibp.co.jp/atclppp/022100041/101400010/> (accessed on Jan. 30, 2024)

¹² *Ibid.*

or those unable to disengage from these relationships may find it difficult to re-establish relationships with others in the community.

Conversely, modern communication has become increasingly difficult. The proliferation of television has heightened the individualization of entertainment, while smartphones and other portable devices for personal use have facilitated personal communication, creating a landscape where individuals can remain constantly engaged. People are now more inclined to socialize in professional settings, with many viewing social gatherings and casual conversations as unproductive. For some, solitude is not a source of isolation, but rather a preference, while others find socializing burdensome.

The basic question is whether social capital is relevant in today's highly individualized society. Many people appear to be solitary but are connected in a virtual world that is imperceptible to others. In a society where "solitary happiness," can be realized in any number of ways, critics argue that external connections and forced relationships are unnecessary.

However, there is a blind spot in the pursuit of "solitary happiness." Medical science has shown that social isolation is detrimental to health and that engaging with others contributes significantly to health in the long term. Fujiwara et al. conducted a study based on a survey from 2016 to 2018, titled "Influence of 'Face-to-Face Contact' and 'Non-Face-to-Face Contact' on the Subsequent Decline in Self-Rated Health and Mental Health Status of Young, Middle-Aged, and Older Japanese Adults."¹³ The research findings are captured as follows: "A two-year prospective study showed that both face-to-face contact (meeting in person) and non-face-to-face contact (telephone calls and e-mails) were effective in promoting good health status among the elderly and the young, but face-to-face contact was more effective. We must recognize the ambiguity of any event, and in Japan), where regional cohesion is minimal, it is in our best interest to find a way to bring social capital to life."

The aforementioned quote underscores the subtle yet indispensable nature of the concept of social capital. Similar sentiments are echoed elsewhere as highlighted in the report of the National Institutes of Health Sciences, which notes that "the concept of social capital is very ambivalent, both in a good sense and a bad sense" (the common ground of understanding is that the concept is polysemic before it is ambiguous). This ambiguity refers to both the advantages and disadvantages that inevitably arise from the use of the concept in any field, with the understanding that it is assumed to be polysemous. While social capital may be constructive and foster voluntary participation, it can also be seen as a form of mutual surveillance, like the "village society" mentioned above. However, when social capital is based on "reciprocity" (i.e., on cultivating the mental capital mentioned above), consensus among participants is readily available. Since it is not compulsory, it can be assumed that the relationship will be maintained on an ongoing basis. Here, the basic premise of social capital is not an exchange based on superficial obligation.

Particularly in Japan, where solitary deaths are increasing amid the onset of a hyper-aged society, there is a pertinent need to consider psychological social capital. Such consideration could promote the state of social welfare in our future society.

¹³ Fujisawa, Y. et al., "Influence of 'Face-to-Face Contact' and 'Non-Face-to-Face Contact' on the Subsequent Decline in Self-Rated Health and Mental Health Status of Young, Middle-Aged, and Older Japanese Adults: A Two-Year Prospective Study," *Int. J. Environ. Res. Public Health*, 2022, 19(4), 2218.

6. Conclusive observations and directions for further research

This paper has endeavored to redefine the concept of social capital by examining specific examples that have been developed both domestically and internationally. Based on the research, including an analysis of the limitations and possibilities of previous examples, we aim to elucidate the relationship between several social capital scores. Utilizing data from the “Social Capital Scale,” independently constructed based on data provided by the Daito Kentaku Rental Housing Research Institute (2023), comprising responses from multiple items by over 800,000 survey participants nationwide (local residents and local issues), we examine the current status and challenges of social capital in various regions. By examining the status of social capital, its challenges and limitations, we seek to further clarify the significance of social capital for the future.

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Research Paper

The Validity of Trans-disciplinary Humanities based on Burckhardt's Historical Study

Sei WATANABE¹

Abstract

In this age of serious social problems, the need for examination of scientific knowledge and evaluation of the humanities has become a necessity. However, criticism of the discipline, which is one of the characteristics of scientific knowledge, and of the application of the scientific method to the humanities arose in the nineteenth century. Carl Jacob Christoph Burckhardt (1818-1897), a historian from Basel in Switzerland, his study is a typical example. This paper takes Burckhardt's critique of science and the thought behind it as clues to discuss the validity of humanities knowledge today.

Keywords: Trans-disciplinary humanities, Burckhardt's Historical Study, Bildung.

1. Introduction

Trans-disciplinary humanities which have been debated in the context of civilization studies are still undefined. Nevertheless, many people would agree that "trans-disciplinary" can be contrasted with "discipline" and that "humanities" can be contrasted with "natural sciences".

Since the nineteenth century, discipline and natural sciences have formed the mainstream of knowledge as forces that bring comfort to people's lives. Today, however, we must pay a huge price for our environmental problems.

Trans-disciplinary humanities are part of another lineage of knowledge that has been running alongside this stream. It serves for something other than to bring comfort to people. This paper traces the flow of trans-disciplinary humanities back to the nineteenth century and seeks the validity of humanities knowledge in Burckhardt's historical study.

History, according to Burckhardt, is poetry and art rather than science, and it is effective knowledge for "leading people to Bildung". The German word Bildung which is described in English as culture or liberal arts emphasizes the nuance of self-formation. Bildung as one of the values that can be contrasted with comfort, and the forms of knowledge that are effective in guiding it are extremely important today. Furthermore, this paper owes much to Torataro Shimomura's *Burckhardt's Cosmos* (1985).

2. Trans-disciplinary humanities as a revolt against positivism

Trans-disciplinary humanities are a different form of intellectual from scientific knowledge. If we depart from this premise, Trans-disciplinary humanities can be regarded as a research attitude based on the history of science as follows.

In 1809, Frederick William III (1770-1840), king of Prussia, established the University of Berlin, and its faculty members were required to achieve in their specialized fields, i.e., discipline. The university was the world's first "research university" which had an evaluation system based on producing original

¹ Student Achievement Center, Tokai University (previous affiliation).

research results in specialized fields. The evaluation system without social class restrictions as in the past encouraged competition among faculty members and created many outstanding specialists who eventually led Germany to become Europe's foremost science nation.

Discipline is applied to fields of natural sciences with great success. A well-known successful case is the organic chemistry of Justus Freiherr von Liebig (1803-1873) at the University of Giessen. "A seven-generation family tree at the Liebig Museum Giessen enumerates scores of Nobel prize winners including the co-discoverers of Vitamin C and Plutonium" (McNeely and Wolverton, 2008, p.219).

Furthermore, a trend arises to apply discipline and natural sciences to the understanding of humans and human society. An example is the thought of Auguste Comte's followers. According to Ernst Cassirer, "Their ambition was to establish a purely naturalistic theory of the social and cultural world. To this end they founded it necessary to negate and destroy all those barriers which seem to separate the human from the animal world. The theory of the evolution had evidently effaced all these differences" (Cassirer, 1944, p. 90).

At the end of the nineteenth century, a rebellion against this trend occurred. Stewart Hughes (1916-1999), in *Consciousness and Society* (1958), called it "the revolt against positivism". According to Hughes, the rebels at the turn of the century thought of positivism as "the word in a looser sense to characterize the whole tendency to discuss human behavior in terms of analogies drawn from natural sciences" and "the most pervasive intellectual tenet of their time" (Hughes, 1961, p.37). The rebels whom Hughes addresses include, for example, Sigmund Freud (1856-1939), Émile Durkheim (1858-1917), Henri-Louis Bergson (1859-1941), Max Weber (1864-1920), and Benedetto Croce (1866-1952).

The trans-disciplinary humanities in the context of civilization studies can be considered a research position based on this idea of revolt. Hiroshi Saito said:

"The foundation for the study of civilization was laid in the thirty years from the end of the nineteenth century to the beginning of the present century in Europe, in the change of academic response to human society. The fundamental change in the academic response to human society has given a common new umbrella to the diverse academic achievements of the time, each of which was not directly connected to the others. That is indeed a change that should be called an intellectual revolution, and it is a situation that must be noted for the study of civilization" (Saito, 1979, p.4).

However, to further our understanding of trans-disciplinary humanities, it is useful to engage in specific research by the rebels. Among such examples, the historical study by Burckhardt is distinctive. That is because Burckhardt's historical study had already expressed its critical position on discipline and the application of the natural sciences to the humanities in about 1868.

3. Burckhardt's critique of discipline

Burckhardt's critique of discipline can be found in his *Weltgeschichtliche Betrachtungen* (1905). This book is based on Burckhardt's three lectures "On the Study of History" at the University of Basel in 1868-1873. Two drafts for the lectures were written in the summer and winter of 1868. This is a remarkable criticism because it predates treason by a generation of late nineteenth century thinkers.

Burckhardt's criticism is expressed in the guise of modesty or even sarcasm. For that reason, the reader might not be able to tell at first glance whether the passage is really a criticism or not. However, Torataro Shimomura's *Burckhardt's Cosmos* explains the fact that it is intended as a criticism. From this point on, we will see whether Burckhardt's criticism is in accordance with Shimomura's interpretation. The following quotation by Burckhardt appears to be a critique of the discipline.

“In learning, on the hand, a man can only be a master in one particular field, namely as a specialist, and in some field he should be a specialist. But if he is not to forfeit his capacity for taking a general view, or even his respect for general views, he should be an amateur at as many points as possible, privately at any rate, for the increase of his own knowledge and enrichment of his possible standpoints” (Burckhardt, 1943, p.30).

The above quotation suggests that Burckhardt regards himself as an amateur (in the original sense, a dilettante) and not an expert. That, according to Shimomura, is not mere modesty. Shimomura points out that “in the ancient sense of the word, a ‘mere expert’ was a ‘craftsman’ (banausen), while a dilettante who always takes pleasure(diletto) in his work was the essential man—a free citizen who is not a slave—” (Shimomura,1983,p.78). Shimomura considers that passage as an expression of Burckhardt's spiritual opinion that his mission was not to train specialists but to lead people to Bildung. Burckhardt considered the latter more valuable than the former. That is because in Burckhardt, to lead to Bildung is to liberate people from the state of unformed existence, i.e., the masses.

Shimomura describes Burckhardt's understanding of the masses as follows:

“The masses are natural human beings, a group of people without ‘culture’ and ‘reason’. That is the essence of the masses. This is not a return to the wild or primitiveness. The masses believe themselves to be good and right. However, that is as a mass, not as an individual. Therefore, they are always incited without realizing they are being incited. For that reason, they are remarkably rabid” (Shimomura, 1983, p.422).

Thus, the above quotation from Burckhardt can be seen as a criticism of the tendency at the time to downplay Bildung and emphasize discipline.

4. Burckhardt's critique of science

Burckhardt's critique of science is as follows: “History is actually the most unscientific of all the sciences, although it communicates so much that is worth knowing” (Burckhardt, 1943, p.74). It is not easy to immediately take the statement that history is unscientific as a criticism of science. Regarding this quotation, Shimomura states: It is not so easy to take the statement that history is unscientific as an immediate criticism of science.

Regarding this quotation, Shimomura wrote:

“His statement that ‘history is the most unscientific’ is neither self-mockery, irony, nor humility, but

rather a frank confession of his beliefs. The meaning that history is not a 'science' is an expression that it is more than a 'science'. And it is the same pride as calling oneself a 'dilettante'" (Shimomura, 1983, p.422).

Thus, only when it is understood that Burckhardt considered history to have more value than science can the phrase "history is unscientific" be grasped as a scientific criticism. What then does it mean that history is more than a science? To answer that question, we must first answer the question of what history represents to Burckhardt.

The sentence in Burckhardt's letter quoted by Cassirer provides an answer to this question. "What I construct historically," wrote Burckhardt in a letter, "is not the result of criticism or speculation but of imagination seeking to fill the gap in observations. To me history is still in a large measure poetry, it is a series of the most beautiful and picturesque compositions" (quoted in Cassirer, 1944, p.257). That is to say, history for Burckhardt is poetry and art.

This view of history as poetry implies that historical writing is not merely a chronological sequence of individual events that occurred in the past but also includes the process of linking and systematically organizing the events. That view is tied to the statement that history is most unscientific because history in this case reveals the subjective operations of the researcher himself. It must have been easy to anticipate criticism of that attitude. Burckhardt nevertheless maintained his attitude of regarding history as poetry with the same pride that he called himself a dilettante.

There is a contemptuous reference to Henry Buckle (1821-1862) in *Weltgeschichtliche Betrachtungen* (Burckhardt, 1943, p.28, 208). Buckle treated history as a rigorous science and attempted to introduce statistical methods. Cassirer, although acknowledging the usefulness of statistical methods in history, stated, "But in spite of this our picture of man would remain inert and colorless. We should only find the 'average' man—the man of our daily practical and social intercourse" (Cassirer, 1944, p.260).

This average man, in Burckhardt's view, would be man as a beast, the masses. On the other hand, art contrast is a creation made by the individual. Cassirer continued, "In the great works of history and art we begin to see, behind this mask of the conventional man, the features of the real, individual man" (Cassirer, 1944, p.260). History as an art, which was considered more valuable than science, has ideology behind it.

5. Conclusion

From the above, it can be understood that Burckhardt's study of history has an affinity with trans-disciplinary humanities in that it has a critical attitude toward discipline and the application of natural science to the humanities. For Burckhardt, history was grasped as poetry or art that includes the process of composition by a historian, and it is an effective knowledge to lead people to Bildung. History in this sense, therefore, can be contrasted with scientific knowledge that serves to make people's lives more comfortable. This is because Bildung is acquired on a difficult path. In today's society, faced with serious problems arising from the pursuit of a comfortable life, it is increasingly important for us to better understand and appreciate the value of the humanities as an alternative to scientific knowledge.

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Research Paper

Concept of ethnicity in Provence and Catalonia in the 19th century¹

Mina Adachi²

Abstract

A major feature of modern Europe is the emergence of the idea of the nation. France in particular developed the idea of the nation-state following the French Revolution of 1789. In postwar historiography, French history has been taken as a framework for the development of a nation-state. However, among the regionalists in Provence and Catalonia through the late 19th century, the existence of ethnic identities that transcend national boundaries are seen. In that context, we find the recollection and sharing of premodern memory centered on the Mediterranean. This study shows a bond in the late 19th century between regionalists and intellectuals in France and Spain and throughout the Mediterranean region. In addition, we examine how such ties form a multilayered ethnic identity that is not bound by national frameworks.

Keywords: Emilio Castelar, Félibrige, Mediterranean ethnicity, pan-Latinism, Provençal and Catalan Literature, regionalism

1. Introduction

The idea of the long 16th century, proposed by Fernand Braudel (1902–1985), reconfigured the history of Europe as a history of a whole rather than that of separate countries. On Braudel's view, the long 16th century (1453–1648)³ encompassed a period of chaos as a result of due to the collapse of the medieval world order, and he analyzed the structure of the Mediterranean world during this period through a combination of multiple specialized perspectives. He thereby attempted to highlight the Mediterranean world by systematizing the environment, human groups, and events, creating a total historical approach based on “history from below.” By contrast, the historical image of Europe that developed in the 19th to 20th centuries remained centered on the historical perspective of each nation-state. While regionalism has been examined in relation to the perspective of international politics, it has also been discussed in the context of the relationship between “nations and regions” as a movement arising in opposition to nationalism.

In France, which began to develop a strong nation-state at an early stage, many forms of regionalism arose, and in Provence in particular, the regionalist movement called Félibrige (founded in 1854) developed an alliance with other Mediterranean regionalists, particularly the people of Catalonia in Spain. They developed a deep relationship and influenced each other. In historical studies, the Félibrige movement is generally examined in the context of the relationship between nation and region in France. However, various elements, including history, tradition, language, culture, and social structure, are

¹ This paper is an expanded and reorganized version of the following report:
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² Institute of Civilization Research, Tokai University

³ In 1453, the fall of the Eastern Roman Empire brought about a crisis for Christendom, resulting in the transition from a feudal to sovereign states. In 1648, the Treaty of Westphalia (Europe's first modern international treaty) was concluded, which began the dissolution of the absolute power of the Holy Roman Empire and established a system of modern sovereign states.

intertwined in this movement. At the root of the movement is a shared consciousness that transcends national boundaries. To consider the history of the movement, a holistic historical perspective is essential.

What kind of people did the *Félibres*, the members of the *Félibrige* movement, interact with in the Mediterranean region, and how did they share their unique ideas in a complex historical development? This paper addresses this issue through an examination of two essays by Castelar, a regionalist who was the president of Spain at the end of the 19th century. These essays were published in the monthly Catalan journal *Pro Patria* and put forward a concept of pan-Latinism. Based on these two essays, this paper examines the interactions between the *Félibres* and Catalan regionalists. From this examination, the paper shows how regional characteristics based on language and culture originally had a common origin and a single bond but formed later each with its own unique ethnicity as modernization developed from the mid-19th century onward.

2. *Félibrige* and Catalan regionalist in mid-19th century: Mistral and Balaguer

Félibrige was a literary group of seven Provence poets based in Avignon. The organization originated from a community of secondary school teachers and their students. At first, it was only a club that gathered fellows through Christian meetings, and in 1854, *Félibrige* was founded as a literary society. The activities of the members of *Félibrige* were not, however, limited to literary arts tended to gradually increasing demands for local autonomy and develop regionalism.

When *Félibrige* was founded, its activities centered around Provence, but it expanded to encompass the whole of southern France and even abroad, including Catalonia (in Spain) and Italy. The first *Félibre* to come into contact with Catalan poets was Mistral. He was a founder of *Félibrige*, the only republican in it, and one of the first to adopt the concept of “federation”⁴ as a designation for the group. In 1866, Víctor Balaguer (1824–1901), a Spanish dissident and revolutionary-minded Catalan poet, fled to Provence during the purges of General Narváez. Mistral struck up a friendship with him, which led to the establishment of the Catalan branch of *Félibrige*. Mistral wanted an independent republic, freedom, and a series of locally led educational institutions to restore the language of his region. In Mistral’s eyes, the federation of *Félibrige*⁵ was a way to preserve the autonomy and ethnicity (in the form of culture and customs) of the Occitan language area. In 1862, It was reported in *Félibrige*’s official yearbook, *Armana Prouvençau*, that “Provence and Catalonia, with their historical ties of language and culture, are to promote our activities together in order that all the literature in which our language is used may be familiar to all parts of France and Spain.”⁶ At 1876, at a conference in Avignon, a Catalan branch was established, and Balaguer was appointed assistant to *Félibrige*.

However, with the advent of France’s Third Republic, Mistral ceased to make official political statements concerning *Félibrige*. However, his ideas were carried on by *Félibres* and others, and Mistral himself appealed to the people in speeches given in the south of France, urging them to take pride in their Occitan language and regional identity, as a “Latin ethnicity.” The content of several speeches also exhibited a shared awareness of the question of language revitalization. Mistral’s idea of a federation was

⁴ Mistral is advocated Proudhon-like federalism.

⁵ Mistral and Balaguer visited Paris together to negotiate with politicians in Paris toward the realization of a federal system.

⁶ *Armana Prouvençau*, 1877, p.17.

reflected in the sense of encouraging the spontaneous movements in various regions.⁷ Here, pan-Latinism is based on the concept of *ibergallitalle* introduced by Claude-François Lallemand (1790–1854), a professor at the University of Montpellier⁸. This concept was originally based on the literary language described in Dante’s *De vulgari eloquentia* (*On Eloquence in the Vernacular*). However, Mistral’s precise concept of pan-Latinism remains ambiguous. It is not clear what kinds of activists he sought to interact with or the extent to which this ideology was shared by other Félibres.

The next section examines the shared consciousness between Provence and Catalonia through an analysis of publications in Catalan at the end of the 19th-century.

3. Regionalism in Catalonia in the late 19th century: Publication history of *Pro Patria*

In the middle of the Bourbon Restoration in Spain, a movement arose in Catalonia to defend Catalan civil law against the introduction of Spanish civil law, and the Federation of Catalonia was founded in 1891. At a meeting in Marenza in the following year, a draft of the regional constitution for Catalonia (the Marenza Draft) was drawn up. By 1906, Catalan regionalism had developed into the political thesis that Catalonia is one country within the composite nation of Spain. The movement to defend Catalonia’s civil law thus developed to become the impetus for the social movement that would transform into Catalan nationalism in the early 20th century.

In 1893, Balaguer, a Félibre of Catalonia, founded, edited, and published *Pro Patria*. The purpose of this publication is stated in Balaguer’s Preface to its first issue.

Spanish, or Castilian writers are content to describe literary works written in other languages as “regional.” What does the word “regional” mean? I have yet to find an author who can clearly and precisely explain the appropriate meaning of this word.⁹

We can understand Balaguer’s protest against the supremacy of the Castilian language against the positioning of Catalonia, the Basque Country, and Galicia as “regions”. However, it is not everywhere clear whether this region was to weigh heavier relative to the national center or whether the independence of its literature was to be asserted.

The authors published in the journal included writers, painters, academics, journalists, and politicians.

The political attitude of the journal was institutional and reformist (featuring a group of ideas called *posibilismo*), and its authors included Francesc Pi i Margall (1824–1901), a prominent Catalan federalist. It is particularly interesting is that the main authors published in the journal were Emilio Castelar y Ripoll (1832–1899), the former president of Spain during its First Republic, and José Guell y Mercader (1840–1905), while he was minister of finance. Castelar became minister of foreign affairs in 1873 and served as president from September 1873 to January 1874, supported by the Conservatives, who desired to establish a unitary republic (*Republica Unitalia*). Throughout his political career, Castelar opposed the federal state,

⁷ Roza also points out that Mistral’s pan-Latinism is connected to a Neo-Latin identity that includes ideas of federalism and democracy. Roza, Joseph P., 2003, p.148.

⁸ Claude-François Lallemand, 1843, pp.65-66.

⁹ *Pro Patria*, 1893. Ene., p.7.

which was advocated by the uncompromising Federalists. However, he appears to have become more tolerant of federalism in his later years. He joined *Pro Patria* as an author, published by Balague, a Catalan regionalist. Mercader, for his part, belonged to the Federal Republican Party (Partido Republicano Federal) in 1868, and in addition to working as a politician, he published a book on regionalism. In particular, after he succeeded Castelar in the company of the Madrid newspaper *La Democracia* in 1874, Mercader served as editor-in-chief of the newspaper under Castelar's patronage. After that, he continued to work as a journalist.

Through these authors, *Pro Patria* represented the federalism of that time, while remaining a literary journal that respected regional languages and cultures. This monthly journal revealed regionalist connections with Catalonia and Provence. This is a result of the publication of Mistral's Provençal poem "Infancy" ("Puerilia") in the section following the preface of the first volume. Thus, the issues that this monthly journal dealt with were not limited to Catalonia: the readership of this journal included regionalists from Provence.

In 1894, Castelar contributed, due to his relationship with Balaguer, "Provençal Literature," an essay on Provençal and Limousin literature, in January, and "Catalan Literature," an essay on Catalan and Italian literature in February. The former was welcomed by Félibrige in Provence, and a translated version (by Léonce Cazaubon) was published in the same year in *Revue félibrienne*, the monthly journal of Félibrige.¹⁰

4. Castelar's two essays contributed to *Pro Patria*

As noted, in 1884, Castelar contributed two essays to *Pro Patria*: "Literatura Provençal"(Provençal literature) in the January issue and "Literatura Catalana" (Catalan Literature) in the February issue. In particular, the former represented the relationship between Provençal and Catalan literature in historical and cultural perspectives. Here, the most interesting aspect is that this essay was presented at the Société Scientifique et littéraire in Provence, where Castelar and *Pro Patria* were held in high regard. The essay was immediately translated into French and published in Félibrige's monthly journal in February, only one month after the original publication. When a translated contribution was published, its author, Castelar, was introduced with the honorific title "Spanish Michelet," after Jules Michelet (1798–1874), an eminent French historian of the 19th century. Thus, Castelar's ideas in his essay were well received and shared by Félibres.

5. Castelar's First Essay (1): Discussion of regions and peoples

"Provençal Literature" begins with the sentence, "The historical characteristics of Provence and Catalonia are very similar." During the Middle Ages, Provençal and Catalan languages developed from Vulgar Latin as indigenous languages, and from the early 11th century to the mid-13th century, the literature of the two were not distinguished.¹¹ It is surely their troubadour origin that connected the literatures of both. Indeed, the troubadours, whether in Limousine or in Provence, formed a family in each region. Nevertheless, they are collectively known as the Provençal poets, although Castelar himself pointed out that less than one-tenth of the entire Troubadour family was from Provence. The first troubadour is now said to come from

¹⁰ Castelar, E., La civilisation provençale, *Revue félibrienne*, t.X, 1894, pp.121-131.

¹¹ Castelar discussed Catalan literature and Valencian literature, established after the 14th century, in an essay published in the February issue.

Limousin, but according to Castelar, although the Limousin family referred to an ethnic group that lived in the limited area from the Loire River to the estuary of the Ebro, Provençal literature, on the other hand, tended to form a southern confederation.

Provençal literature tended to form an illustrious Celtic-Roman confederation in opposition to the Celtic-Frankish tribes on the right bank of the Loire. In the south, there were counties ruled by monarchs, democratic cities, towns and villages, and traditional culture, where not only a political national identity made up of diverse cultural elements but also a true literary union was born.¹² (emphasis mine)

This southern confederation does not imply separation or independence from the north. Considering that Castelar advocated a unified republic, he viewed the conflict between the north and south of France as meaningless.

It was in vain that the barbarian Clovis baptized the southern peoples, in vain did the barbarian Charles Martel save them from the Arab yoke, and in vain did the barbarian Charlemagne give them a semblance of unity.¹³

According to Castelar, the Languedoc of the 12th century was a strange Babel: the Crusades, heresy, the introduction of strange ideas by Jewish peddlers and the change of perceptions by the five senses caused by the importation of oriental textiles and spices. The following ethnic groups emerged as a result of this.

The turmoil that occurred among Iberians, Basques, Gauls, Celts, Normans, Romans, Greeks, Byzantines, Jews, Arabs, and Italians inevitably led to active social movements and ideas. He brought about change and had an immeasurable influence. In France and Spain alike, in Spain and Italy alike, that is to say, in the three great regions which were being formed by the elements extracted from that extraordinary source of light and life, its brilliance turned into thought, the enlightenment of the spirit, its fever turned into power, and the germ of peoples and states (*pueblos y naciones*) arose at that time, after several monumental polities (*estados*).¹⁴

While Castelar acknowledged that the prototypes for France, Spain, and Italy were formed around the 12th century, he pointed out the fateful rivalry between the Franks and the Romans.

The fundamental conflict between the Franks in the north and the Romans in the south signified the law of the times, which both sides follow without thinking.¹⁵

¹² *Pro Patria*, 1894. Ene., p.7.

¹³ *Ibid.*, p.7.

¹⁴ *Ibid.*, p.8.

¹⁵ *Ibid.*, p.9.

Castelar then grasped southern cooperation as a historical law.

The driving force behind their actions was the intention to form a grand southern confederacy (*una grande confederación meridional*), in which they kept the political and literary rivalry of the Provençals with the Franks, with their art, inspiration, and energy.¹⁶

6. Castelar's First Essay (2): Discussion of Provençal and Catalan literature

Thus, from around the 12th century there was a basis for forming "one grand southern confederacy" "among the Roman tribes in the south." Castelar's argument suggests that, from around the 12th century, the foundations of this southern confederacy had been formed among the Roman tribes in the south. Castelar pointed out that it was in this situation that "Provençal literature," or "*neo latina literature*," was born. Here, Provençal literature was to have begun with the genre of epic, which is impersonal and objective. The earliest inscriptions are typical translations of Boecio, an antidogmatic classic written in the late 10th or early 11th centuries. Following this, religious sentiments inspired Provence's songs. Castelar went on to write that during the Carolingian period, influences from the ancient Asian world began to appear, as seen in the Songs of Roland and the Tales of Chivalry. Later, when the epics stopped being written, true troubadours emerged from the objective epics, just as they had done in the stages of civilization. Their works were personal and subjective, producing works that could hardly be described as Christian doctrine, depicting jousting and courtship.

In troubadour tradition, Provençal and Catalan poetry were initially the same, despite dialectal differences. However, the later Kingdom of Aragon abolished the independence of southern France and increased the independence of southeastern Spain. Finally, under the Kingdom of Aragon, a close alliance between Catalonia and the Kingdom of Aragon was forged, and from this a new Catalan literature was born.

The Frankish kingdom at this time supported supradenominationalism and unified church discipline, despite the divisions and sectarianism that had existed because the Middle Ages. Castelar concludes that it was natural for the Franks in the north to turn toward orthodoxy and the Romans in the south to turn toward heresy. He considered the importation of heretical ideas to the south as recapitulating the appearance of the idea of a dualistic relationship between good and evil reappeared in the 11th century due to both the invasion of the Slavic peoples, who besieged the Byzantine Empire, and the introduction of Manichean ideas.

The south had the most suitable land and best climate for accepting the ideas of another heresy, the Albigensians. In the mid-12th century, Pope Innocent III began to suppress the Albigensian faction to win the same honor as Gregory VII. Innocent III knew that if he could eradicate heresy, his authority could subdue Provence.

However, the Albigensian Crusades were not merely religious oppression. Regarding this, Castelar says,

¹⁶ *Ibid.*, p.9.

Eventually, Provençal literature was imported to various places at the end of the 13th century and changed. In the East, it merged with Italian literature, which had a great influence on European literature. To the west, it merged with Catalan literature and influenced Spanish literature.¹⁷

In fact, the Albigensian Crusades not only eliminated religious heresies but also suppressed the Provençal language in southern France and reduced its influence. As a result, the Provence literature also declined and lost its momentum. This is what Castelar mentioned above, and this fact can be considered as a manifestation of Catalan literature.

The arguments in Castelar's first essay can be summarized as follows. Provençal and Catalan literature have a common linguistic basis, formed from Vulgar Latin through the troubadours, but in their subsequent histories process, they each came into being as a separate and independent literature. Nevertheless, Provence and Catalonia, to a degree, share a common language and culture, and Pan-Latin roots can be found there.

7. Castelar's second essay on Catalan literature

Castelar's second essay emphasizes the independence and uniqueness of Catalan literature. In it, he showed that the soil where Catalan literature was born was influenced by the sciences of Sevilla and Cordoba, as well as by Arabic science and architecture. The influence of the 13th century Aragonese monarchy is also pointed out, but in particular, he mentions the importance of the Italian territory received from Emperor Frederick II and the importation of ancient Greek and modern Arabic science.

Catalan literature came to maturity in the 15th century and came to develop close ties between Italy and Spain, and later met Provence, Italy, and Greece in the Mediterranean. In particular, the Italian leanings of Catalan literature produced Ausiàs March (1400–1459), whom Castelar called the first and most characteristic lyric poet of the Middle Ages. Ausiàs March was a medieval Valencian poet and was the first to sing in Valencian instead of the Provençal (Occitan) language used by the troubadours.

After the achievement of patriotic unity in Catalonia and Valencia through Ausiàs March, lyric poets and dramatic poets appeared in Catalonia through Boscan (Joan Boscà i Almogàver: c.1490–1542). However, Castelar insisted that Catalonia and Valencia were not separate from Spain. This is because, he said, due to historical and social circumstances, the “motherland” (i.e., Catalonia and Valencia) was one with Spain, the national spirit flowed like in a planet system.

Castelar argues that, from its beginnings until the 13th century, Catalan literature had been confused with Provençal literature. By the 14th century, Catalonia had developed its own politics and produced masterpieces of lyric poetry, history, philosophy, nature, science, and exact science. The period from the end of the 14th century to the beginning of the 15th was known as the Golden Century (“Segle d'or”), and a unique Catalan literature was born.

Finally, Castelar concluded his second essay as follows:

Some scholars say that the Germanic people copied the Holy Grail tradition from Provence, while others say that Amadis de Gaura (one of Spanish Chivalry) originated in Provence itself..... Those

¹⁷ *Ibid.*, p.15.

who have the poetry of a privileged region in any era have a nation (ethnicity)...¹⁸

8. Conclusions and future prospects

In 1894, Castelar contributed two essays to *Pro Patria*, which published mostly Catalan regionalists. In these essays, the relationship between Provence and Catalonia seemed to be viewed from two perspectives: the nation and the Mediterranean. In particular, Castelar saw France as made up of a confederation consisting of the Franks in the north and the Romans in the south. This may be involved with the idea of a federation, which was unique to Spain at that time. Castelar and his ideas were admired in France and even accepted in Félibrige. Examining this contribution together with other essays in *Pro Patria* (e.g., Castelar's "Ideal," Balaguer's "Pro Patria," etc.) reveals not only Castelar's ideas at the end of the 19th century, but also the regions of southern France and southeast Spain. This study will shed light on the historical relationship between the various people of the Mediterranean region.

In conclusion, Castelar's essay indicates that the issue of pan-Latinism in southern France and southern Spain since the late 19th century is not simply a problem of language and culture but also a problem of history, tradition, language, and culture over a long period. Therefore, it is important to consider regional consciousness in terms of identity and ethnicity. This object can be regarded against the backdrop of Braudel's long 16th century. Therefore, concerning the languages, cultures, and peoples surrounding the Mediterranean world, a comprehensive historical examination from multiple perspectives is indispensable.

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¹⁸ *Pro Patria*, 1894. Feb., p.94.

Research Paper

Study on practicality in the historical development of mathematics

Yoichi HIRANO¹

Abstract

Mathematics is a science that is abstract and logical, and thus, it has numerous practical applications. In this sense, mathematics can be thought of as having two components: theory and practice. Under this understanding, theories in mathematics are developed first, followed by applications. However, given historical developments in mathematics, this is not always the case. In mathematics, theories are sometimes developed inductively based on practical requirements, and sometimes practicality becomes the focus of research. This practicality contains a variety of patterns. This paper presents the following three cases as examples of practicality in the historical development of mathematics: (1) practical application based on mathematical theory; (2) practical activities that incorporate mathematics and then form theories; and (3) development of practical mathematics with a focus on social needs. These examples can be viewed as cross-sections of the development of mathematics, and we will present one viewpoint on how mathematics has developed as a discipline.

Keywords: historical development of mathematics, feature of mathematics, Renaissance mathematics, practicality of mathematics

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1. Introduction

Mathematics is generally a theoretical discipline that is abstract and logical. Mathematics can be established even if no concrete phenomena exist in the real world. It is because mathematics seeks thoughts rooted in the deepest recesses of the human mind. In consequence, it creates a world of abstraction and logic. Meanwhile, because of their abstractness and logic, mathematical theories can be used in various ways. Regarding the duality of theory and practicality in mathematics, Hiroshi Nagai notes that mathematics has both ultimate abstraction and a high degree of applicability.²

For the reasons stated above, it is natural to view the historical development of mathematics as a history of theory formation. On the contrary, various practical experiments have resulted in the development of concepts that promote the formation of mathematics. In fact, humans use mathematics without understanding its theoretical foundations, and these activities can sometimes help facilitate the formation of mathematical theories. For example, humanists and artists during the Renaissance used mathematics in specific situations, and their activities are well known to have influenced the subsequent development of mathematics. This paper, which focuses on the practicality of mathematics, provides examples of human mathematical activities throughout history. Through such an attempt, the paper presents a cross-section of the academic discipline of mathematics, resulting in a better understanding of

¹ Institute of Civilization Research, Tokai University

² Nagai, Hiroshi (1967), "The reality of mathematics – a problem of mathematical philosophy," *Shiso (Thought)*, March 1967, pp.297-310 (in Japanese).

mathematics.³

2. Research Questions

What kind of practicality does mathematics offer? Humans not only learn and practice mathematics, but they also apply it unconsciously in their daily lives. We refer to these human activities, which include a wide range of mathematics-related activities, as the “practicality of mathematics.” In other words, we consider mathematics’ practicality to be both the application of mathematical theory to specific cases and, in a broader sense, a general means of mathematically understanding various phenomena, including everyday life. The former is an example of consciously applying mathematical theory to maximize its effectiveness. The latter is an example of how practical problems are addressed regarding mathematical content rather than whether mathematics is effective. That is why this paper considers “practicality in a broad sense.”

In this context, various patterns can be found in terms of practicality. In this paper, we will focus on the following three cases⁴:

- (1) Practical application based on mathematical theory;
- (2) Practical activities that incorporate mathematics and theory formation from there;
- (3) Development of practical mathematics with emphasis on social needs.

3. Case Study 1—Alberti’s problem in his “Ludi Matematici”

The first case, “(1) Practical application based on mathematical theory,” is ubiquitous in terms of mathematics’ utility. In general, when we discuss the abstractness, logic, and practicality of mathematics, the term “practicality” refers to a wide range of applications, from everyday use of mathematics to advanced applications in the natural sciences. A historical example of this can be found in “Ludi Matematici”⁵ (1450-1452), literally “Mathematical Games”) written by Leon Battista Alberti (1404-1472), a humanist during the Renaissance.

Here, we present a typical example from this book. The problem is “to measure the height of a tower where only the tip of the spire is visible.” This is an example where the distance between the measurer and the bottom of the tower is unknown (Fig. 1).

In this example, Alberti explains:

- 1) Locate two points (D and C in Fig. 1) where you can see the tower’s tip and measure the distance

³ The dual perspective of mathematics, theory, and practice is similarly emphasized in today’s mathematics education. Just as (Science, Technology, Engineering, Art, and Mathematics (STEAM) education has been introduced in today’s science education, there is a tendency in mathematics education to seek respect for a broader range of mathematical activities while teaching mathematics as a logical construct.

⁴ As a basis for this study, the research group, including the author, has so far examined practical knowledge of mathematics during the Renaissance period as follows:

Nakamura, T and Hirano, Y. (2021), A Consideration of Mathematics in the Renaissance: In the Terms of Modern Science and Bricolage, *Civilizations*, Institute of Civilization Research, Tokai University, No.29, pp.49-58.

Hirano, Y. and Nakamura, T. (2023), Practical knowledge and comprehensive knowledge in mathematical activities during the Renaissance (1), *Mathematics Education Society*, March, 2023 (oral presentation, in Japanese).

⁵ Here, we refer to the French translation, as follows:

Alberti, Leon B. (2002), *Divertissements mathématiques*, traduit par Pierre Souffrin, Édition du Seuil.
The Fig. 1 is also cited from the above document (p.39).

- between D and C.
- 2) A stick is then erected between these two points and the tower, allowing the measurer to measure the length.
 - 3) Using the similarity of the two sets of right triangles ($\triangle GFB \sim \triangle GCH$ and $\triangle DEB \sim \triangle DCH$), we can determine how many times HG and HD are the height of the tower CH.
 - 4) Since the difference DB (between HG and HD) is known, the tower height can be calculated accordingly.

Although Alberti's explanation relies on the similarity of right triangles, the tangent can also be applied by taking the elevation angle when looking at the tip of the spire C from the two points D and G. However, at the time, the concept of the trigonometrical ratio was not widely known, and vernacular people were more familiar with the similarities between triangles. Furthermore, Alberti's method of explanation is quite practical because he explains the solution using simple numbers as a concrete example. For example, if DH is m times CH and GH is n times CH, then

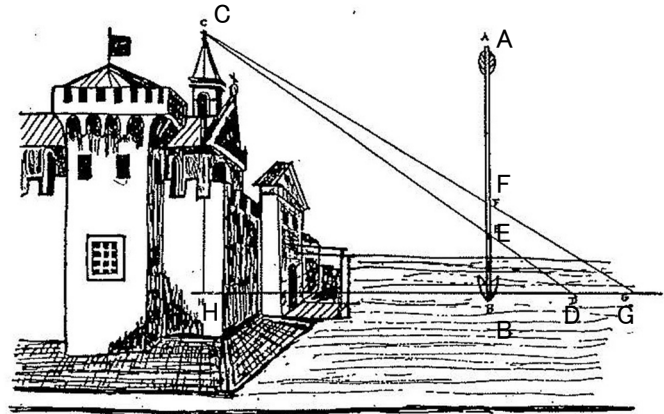


Fig. 1. Example to measure the height of a tower.

$$CH \times (m - n) = d,$$

which reduces the problem to a linear equation.

Based on the evidence presented above, it is clear that Alberti was well-versed in the similarity of figures and simple linear equation solutions. However, he did not provide such explanations but introduced concrete practical examples. The fact captures the meaning of mathematics to ordinary people at the time. They did not need mathematical theory, just practical applications. It can also be argued that such practical mathematics were required in public school education and even vernacular schools. Therefore, we see a scene, in which a small group of experts familiar with various mathematical concepts teaches practical application methods.

4. Case Study 2—Perspective described in Alberti's "Della Pittura"

The second case, "(2) Practical activities that incorporate mathematics and theory formation from there," refers to one of the processes involved in forming mathematical theories. It is because it includes the fact that general concepts can be deduced inductively from people's experiences. Here, we discuss an example of Alberti's early study of perspective, which is found in his treatise called "Della Pittura" (On Painting, 1435).

In his "On Painting," Alberti explains how a pavement made of squares appears when viewed using one-point perspective, as shown in Figure 2. It is unclear if this drawing is his own.⁶ Regarding Fig. 2,

⁶ We discuss, here, Alberti's "Della pitura" by referring the following publications:

Alberti states, “Lines drawn in this way visually show how the width changes, as if you were looking into infinity.”⁷ This sentence appears to imply the following two things. The first is that when looking down on this pavement from a diagonally above position a short distance away, the entire pavement (vertical lines) converges to one point (existence of a vanishing point). The other relates to each horizontal line’s position (height in the drawing plane) on the pavement.

Regarding the first problem, Alberti, quoting Euclid, says, “No object can be seen above this line (a transverse line passing through the central point), when any such objects are not higher than the eye level of the person looking at it.”⁸ It is assumed that this statement refers to Euclid’s “Optics.” Actually, the following propositions are stated in Euclid’s “Optics.”⁹

“Prop.12: In the case of lines extending forward, those on the right seem inclined toward the left, and those on the left seem inclined toward the right.

Prop.13: In the case of lines of equal length, lying below the level of the eye, those lying farther away appear higher.

Prop.14: In the case of lines of equal length, lying above the level of the eye, those lying farther away appear lower.”

Given these propositions, the existence of a vanishing point is easily contested.

Another issue concerns the actual drawing. For example, during the Renaissance, many illustrations were created by looking through a hole in a board. In other words, artists at the time were thinking about drawing in perspective in a practical sense. Today, however, perspective drawings can be easily obtained using plane and side views of an object. When drawing an object from space onto a plane, it is critical to consider how a horizontal line and a perpendicular line to the screen are drawn. To do so, it is necessary to know where a specific point in space is drawn on a plane (screen). Because a plane is two-dimensional, knowing a point’s vertical and horizontal positions allows it to be fixed. Using modern descriptive geometry, the position of the point on the plane can be determined by the top (plane) view (horizontal position) and side view (vertical position) of the three-dimensional-projections. From this perspective, Alberti’s explanation represents the outcome of combining these two figures (views) into a single total figure.

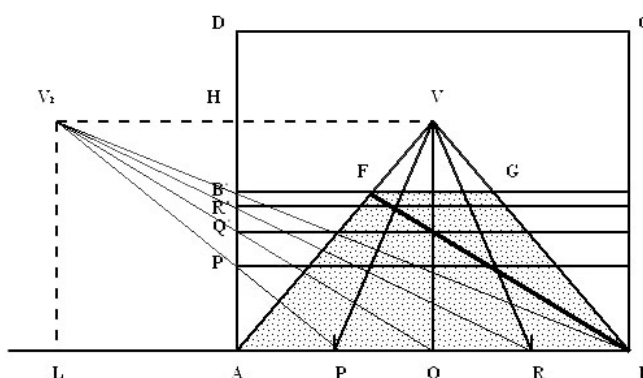


Fig. 2. Alberti’s explanation for perspective

Alberti Leon B. (1804), *Della pittura e della statua di Leonbatista Alberti*, Milano : Società tipografica de'Classici italiani.
 Alberti Leon B. (1992), *Della pittura* (Japanese translation), trans. by F. Miwa, Chuo-koron Bijutushuppan.

⁷ *Della pittura* (Japanese translation), p.26.

⁸ *Ibid.*, p.28. (Here, () is supplementary by the author)

⁹ *The Optics of Euclid*, translated by H. E. Burion, Journal of the Optical Society of America, Vol.35, No.5, 1945, pp.357-372.
 URL: <https://philomatica.org/wp-content/uploads/2013/01/Optics-of-Euclid.pdf> (accessed on Feb. 2, 2024)

Consider the history of perspective, which includes the “Anamorphose” of Jean-François Nicéron (1613-1646) and Athanasius Kircher (1602-1680). The term “Anamorphose” refers to a type of *trompe l'oeil* that employs the reverse perspective theory. Finally, the theory of perspective came to fruition in the 19th century with descriptive geometry and projective geometry, as represented by Gaspard Monge (1746–1818). However, during the Renaissance period, it evolved into an attempt to depict space as seen on a flat surface faithfully. There, we discover a cradle for the development of mathematical theory.

5. Case Study 3— Cauchy’s attitude at the beginning of the development of the theory of algebraic equations

The third case, “(3) Development of practical mathematics with an emphasis on social needs,” refers to the category of human activities in which mathematics is used. In other words, the scope of mathematics can be considered in various ways, both narrow and broad. This section uses the relatively narrow example of Augustin Louis Cauchy (1789-1857), who worked on algebraic equation theory in the early nineteenth century.¹⁰

The “algebraic unsolvability of quintic equations” is a defining feature of algebraic equation theory. This means that the solutions of the fifth and higher degrees equations cannot be expressed using four arithmetic operations and radicals (square root, cubic root, etc.). More technically, the permutation (replacement) of solutions is critical in equation-solving methods. Because the coefficients of the initial equation are all symmetric expressions of the solutions, the values of all rational expressions of the coefficients remain constant regardless of the solutions’ permutations. As a result, when considering the ‘field’ based on the coefficients, the elements of the ‘field’ are invariant under solution permutations. Now, if some radicals required for the solution are added to the basic field (field extension), the set of permutations (group of permutations) that make the extension field’s elements invariant will be reduced. Finally, the solvability of equations is discussed in terms of how the group of permutations is reduced when the radicals required for the solution are sequentially adjoined.

As a result, the solvability of algebraic equations can be discussed in terms of the dual principles of permutation reduction and field extension. Évariste Galois (1811-1832) introduced the concept in his youth. However, in terms of unsolvability, Paolo Ruffini (1765-1822) and Niels Henrik Abel (1802–1829) demonstrated the Abel-Ruffini theorem. The former began researching this problem at the end of the 18th century, and the latter published his first paper on the subject in 1824.

Ruffini began studying equation theory in 1799, building on the work of Joseph-Louis Lagrange (1736–1813) and others of the time. He was particularly interested in the properties of permutations that make rational expressions of solutions invariant. In 1813, after six treatises, he proved the unsolvability. It is likely that Cauchy, who was a prominent figure in France at the time, valued this type of research.¹¹

However, there is one interesting fact about Cauchy. Ruffini asked Cauchy about his own research on the solvability of algebraic equations, and in his letter to Ruffini in 1821, Cauchy wrote the following:

¹⁰ The historical development of the theory of algebraic equations were examined in the author’s research: Hirano, Y., “Quelques remarques sur les deux mémoires de WANTZEL—qui concernent les problèmes des constructions géométriques et la résolution des équations algébrique, field,” 『東海大学紀要文明研究所』、第9号、1989、pp.37-65.

¹¹ Discussing the basics of permutations such as the properties of cyclic permutations and transpositions, Cauchy published two papers on a similar subject in 1815. His work can be regarded as the development of Ruffini’s research. Both Abel and Galois have recognized Cauchy’s works.

“If I did not discuss it (the solvability of algebraic equations) in my lecture on analysis, it is because this lecture was prepared for students at the *École Polytechnique*. This is because the lectures cannot deviate too much from the topics set out in the *École*’s curriculum.”¹²

At the time, equation theory was covered in higher education mathematics lectures. Nonetheless, at the *École Polytechnique*, which was known for its cutting-edge education at the time, the subject matter was finding concrete solutions to equations, including approximate solutions, and the theoretical aspects of the existence or nonexistence of solutions were not covered in class. Simply put, the subject did not fit into the curriculum.

Cauchy’s response, as quoted above, demonstrates how time and space can influence mathematical research and education. More than that, this demonstrates one of the characteristics of French mathematics: the tendency for mathematical research to have concrete, albeit theoretical, goals.

In fact, Joseph Liouville (1809-1882), the first person to publish Galois’ posthumous manuscripts, remained in this category. M. E. Camille Jordan (1838-1922), who was the first to explain Galois’ idea in France after 1860, was also classified in the same category. Even in the early twentieth century, he was working on permutation groups in group theory research. Finally, in 1857, a German mathematician, J. W. Richard Dedekind (1831-1916) gave the first lecture on Galois’s works as abstract mathematical theory.

6. Tentative conclusion and observation for the future

Let us review the three cases presented in this paper. Although based on mathematical theory, the first case study provides practical benefits to people. In the second case study, while mathematical theory is not yet clear, people’s practical activities include the possibility of creating “mathematical contents and elements.” The third case study suggests that mathematics is a rigorous theoretical construct, but it is not required for education.

Many examples, particularly in the third case study, can be found in a broad sense. A good example is found in Euclid’s *Elements* (Proposition 5 of Book 1): “The base angles of an isosceles triangle are equal.” This proposition is proven through triangle congruence in today’s secondary education, but this method is logically inconsistent. Euclid’s *Elements* faithfully proves this proposition logically; this problem is known as the “bridge of assessments” due to the circuitous argumentation process. This category also includes the Renaissance-era example of Luca Pacioli (1445-1517). In his famous mathematical treatise, “*Summa*,” he deals with practical problems such as the “height of walls” and “balances” in the section of Euclidean geometry. Furthermore, he uses unproven propositions to prove some propositions in his publication of Euclid’s *Elements* in 1509, which does not necessarily constitute a systematic proof (simplicity is given priority over the rigor of the proof).

Mathematics has not evolved solely as a theoretical construct, as evidenced by the practical problems encountered throughout its history. This is because humans think about mathematics and human thinking can be influenced and shaped by various practical activities. There should be a recognition of the true nature of mathematics.

¹² Ruffini, P. (1954), *Opere Matematiche di RUFFINI*, tome III., p.89.

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