

<https://doi.org/10.26881/rgtn.2022.03>

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## TOWARDS THE PHILOSOPHICAL MEDITATION ON THE TECHNICAL SCIENCE AND THE HUMANITIES

The further into the forest, the more trees.<sup>1</sup>

### Prologue

At the beginning, the authors want to clarify one point. This article results primarily from the long-term interests of the first author in various areas of human culture. However, this is secondary to the theory of structures, which is his main technical research field as a civil engineer and corresponding scholar.

As it happened, he similarly “infected” the second author, a doctor of architectural engineering at the University of Tokyo. She specializes in the aesthetics of infrastructure, particularly in the field of railway stations, station squares, elevated structures, and bridges.

### Introduction

When touching on the issue of philosophy, it is worth first referring to its very beginnings, related to some ancient beliefs of mankind. The authors wish to recall only those from the Bible and cuneiforms found in Mesopotamia. The following thoughts can be found there: “Let us make man in our image, in the likeness of ourselves [...]”<sup>2</sup> and “what has

<sup>1</sup> Polish proverb: Im dalej w las, tym więcej drzew.

<sup>2</sup> Genesis 1, 26 [in:] *The New Jerusalem Bible*, London 1986.

come into being, in him was life.”<sup>3</sup> Life has always been and still is the most important object of human interest. The continuation of human concern for life, time and space treated in different cultures in different ways remains universal. Michelangelo’s *Creation of Adam* (ca. 1511), which is widely believed to represent the biblical essence of creation, is displayed on the facade of the Tainan Museum of Art (2019), designed by the Japanese architect Shigeru Ban (fig. 1).



Figure 1. *Creation of Adam*, Tainan Art Museum, Taiwan

Source: photo E. Kido.

According to the cuneiform story of Gilgamesh, king of Uruk (Erech in the Bible), “the span of human life was all too short”. That is why he was eager to find “the secret of eternal life.”<sup>4</sup> In the past, the authors were able to visit the anticipated area of Eden along with many excavations in Sumer, Babylon, and Assyria – the ruins of Uruk, including (fig. 2).

<sup>3</sup> Prolog 1, 4 [in:] *The New Jerusalem Bible*, London 1986.

<sup>4</sup> I. Finkel, *The Hero King Gilgamesh*, London 1998, p. 3239.



Figure 2. Remains of the Uruk ziggurat

Source: photo Z. Cywiński.

These two very ancient traces of philosophy – religious and secular, were followed later by numerous others.<sup>5</sup> The authors also wish to refer to the idea of Leonardo da Vinci's *Vitruvian Man*, representing close relationships between man and nature – both in the micro- and macrocosm. However, the achievements of modern physics have made the interrelated problems of time and space<sup>6</sup> special subjects of philosophical study.

Reference will also be taken to the well-known fact that all human reasoning is subject to gradual change over time – for successively achieved goals that were initially believed to be true later turned out to be false, and the corresponding way of thinking had to be replaced. The research background of the authors will also be briefly shown – as the basis for their philosophical and engineering considerations.

### Research background

Recalling the most characteristic publications of the authors, the course of their interest in the philosophical relationship between technology and humanism will be briefly presented on the example of engineering and architecture.

<sup>5</sup> J. Tomkowski, *Historia myśli od starożytności do XX wieku*, Warszawa 2002.

<sup>6</sup> J. Gribbin, M. Gribbin, *Czas i przestrzeń*, Warszawa 1995.

The first author was greatly influenced by the presentations and results of the 10<sup>th</sup> IABSE Congress Tokyo 1976, in which he participated. He found the various aesthetic aspects of Japanese bridge engineering (environmental coherence, harmony with cultural heritage and landscape, etc.) very intriguing and decided to deepen that field with his own research. Cywiński actively followed this path, presenting papers at all seven national conferences “Aesthetics of Bridges” (1993–2011) – also being a member of their respective scientific committees. A summary of these studies, referring to the specificity of Japan, was given in his book.<sup>7</sup>

Further research in the years 1994–2012 covered the mutual relationship between technology and humanism, initially concerning the education of civil engineers.<sup>8</sup> The view was expressed that the education of engineers should be based on the proper development of their intellectual abilities – which should be based on a mature thinking process. In fact, general education itself should be considered a *sine qua non* condition for mastering all other sciences, including the technical ones. Related extended thoughts by the first author can be found in his following two articles:

- “True development must be considered as a problem of philosophy. It must be based on the priority of spirit over matter, person over object, and ethics over technology. It should respect the needs following from the metaphysical order of truth and goodness.”<sup>9</sup> The appropriate intellectual capacity of mankind is necessary here.
- “Theory” reflects the spirit, and “practice” – the matter of any professional work of an engineer; spirit is hereby recognized as primary. It is evident that modern engineering is largely related to philosophy and the spiritual elements of culture. They are deeply rooted in theory, which – being responsible for formulating ideas – is considered the offspring of wisdom, the mother of thinking and understanding. Engineering education addressing the development of creativity and understanding is always very much needed. The wisdom of thinking provides it with the necessary general basis.<sup>10</sup>

It is also worth emphasizing the first author’s dedication to the issue of engineering heritage – an important element of the cultural landscape. This commitment is reflected in his involvement in the organization of four specially profiled international conferences (1993–2005) in Gdańsk.

While he was influenced by various international conferences (e.g., IABSE) and publications, he also influenced researchers in engineering aesthetics and engineering education.

<sup>7</sup> Z. Cywiński, *Mosty w Japonii*, Kraków 2001.

<sup>8</sup> Idem, *Na ścieżce równowagi między techniką i humanistyką w rozwoju inżyniera*, „Rocznik Gdański” 2019, nr 79, pp. 149–154.

<sup>9</sup> Idem, *Current philosophy of sustainability in civil engineering*, “Journal of Professional Issues in Engineering Education and Practice” 2001, vol. 127, no. 1, pp. 12–14.

<sup>10</sup> Idem, *Engineering theory and practice: Wisdom of thinking*, “Civil and Environmental Engineering Reports” 2005, no. 1, pp. 49–59.



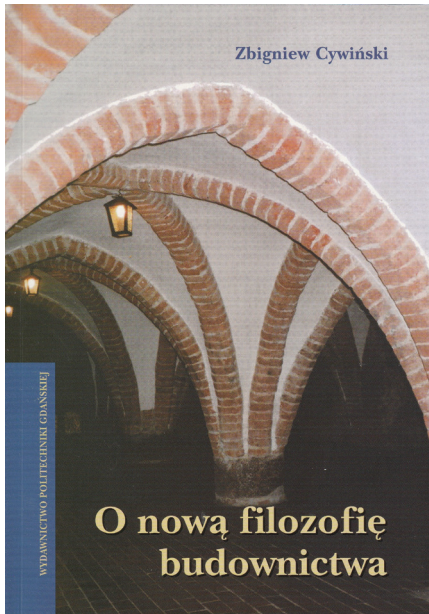


Figure 3. The cover of the book *For a new philosophy of construction*

Source: photo Z. Cywiński.

Two of his publications have been particularly fruitful for the second author's professional development. Article<sup>11</sup> points to the philosophical genesis of the aesthetics of bridges, and the paper of the SEFI Conference<sup>12</sup> points to the growing importance of art in structural engineering. The vigorous development of glass in construction and its major influence on the contemporary understanding of the idea of spirit and matter in actual civil engineering and architecture – design and construction – has also become a new topic of mutual interest. A certain summary of thoughts related to the aesthetics of engineering and comprehensive education of civil engineers is his book<sup>13</sup> (fig. 3).

The second author's doctoral thesis<sup>14</sup> became her first major contribution to professional research. Later, working in a Japanese design office, consulting company, research institute and university, she systematically developed her scientific and

professional knowledge – theory and practice – of Japanese architecture and civil engineering. Kido's research field includes Japanese architecture and *infura no keikan dezain*, which can be translated from Japanese as the aesthetics of infrastructure. Among some contributions in these fields, there is participation in the "Studies on Modern Architecture" by the Nicolaus Copernicus University in Toruń,<sup>15</sup> as well

<sup>11</sup> Idem, *Tło filozoficzne mostu i jego estetyki* [in:] *Konferencja naukowa z okazji 70-lecia urodzin profesora Józefa Głomba. Wybrane problemy naukowo-badawcze mostownictwa i budownictwa*, red. A. Kłobuszowska, Gliwice 1997, pp. 79–88.

<sup>12</sup> Idem, *Humanities and arts – essential agents of the contemporary engineering education* [in:] SEFI Annual Conference 1997, "Humanities & Arts in a Balanced Engineering Education", Cracow 1997, pp. 22–35.

<sup>13</sup> Z. Cywiński, *O nową filozofię budownictwa*, Gdańsk 2010.

<sup>14</sup> E.M. Kido, *Aesthetics and philosophy of structural design in the context of Japanese bridges*, Doctor Dissertation, University of Tokyo 1995, pp. 1–510.

<sup>15</sup> Eadem, *The new Japanese architecture / Nowa architektura japońska*, "Studia z Architektury Nowoczesnej / Studies on Modern Architecture" 2011, vol. 4, pp. 147–209; eadem, *Art at the railway stations/Sztuka na dworcach kolejowych w Japonii i Europie*, *Studia z Architektury Nowoczesnej / Studies on Modern Architecture* 2021, vol. 8, pp. 47–81.

as the paper on aesthetics of elevated railways.<sup>16</sup> The book<sup>17</sup> on aesthetics of railways, containing the comparison of station design in Japan and Europe has been the second author's the top achievement so far (fig. 4).

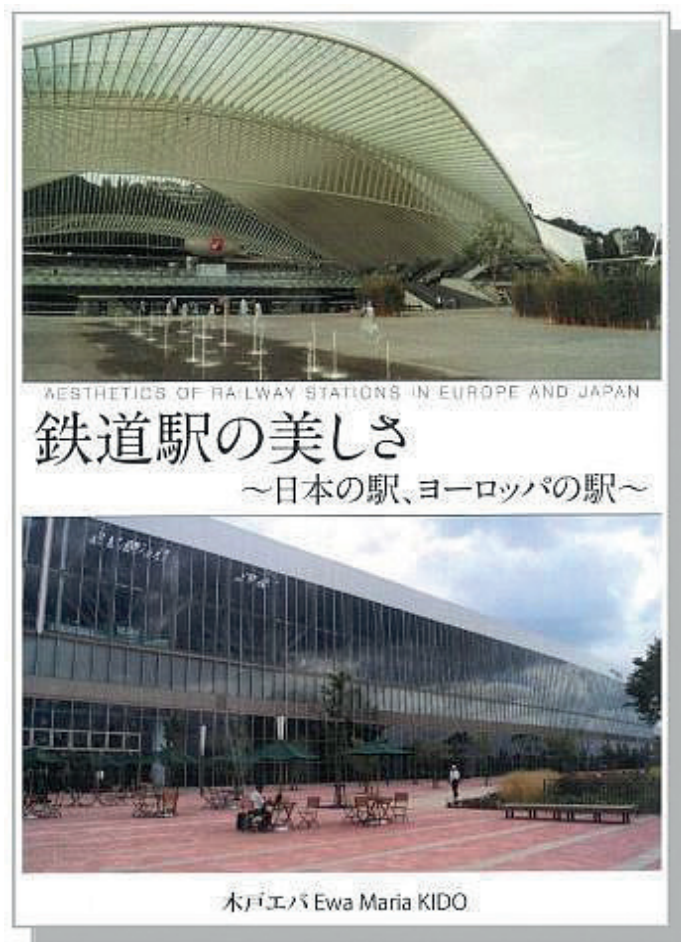


Figure 4. The cover of the book *Aesthetics of railway stations in Europe and Japan*

Source: photo E. Kido.

<sup>16</sup> Eadem, 高架鉄道景観デザイン並びに鉄道高架下の空間利用 [*Aesthetic design and use of space under the elevated railways*], 土木施工 ["*Civil Engineering Construction*"] 2019, vol. 4, no. 60, pp. 116–120.

<sup>17</sup> Eadem, 鉄道駅の美しさ～日本の駅、ヨーロッパの駅～ *Aesthetics of railway stations in Europe and Japan*, CTI Engineering and Institute for Transport Policy Studies, Tokyo 2016.

However, both authors also started their common investigations. Among ca. 40 publications, two papers emphasize the necessity of sustainable development and the value of cultural landscape,<sup>18</sup> as well as the need of aesthetics in bridge design.<sup>19</sup> Four definitions were important as the background to this collaborative research:

- “Structural engineering” is understood as the science of planning, design, construction, operation, monitoring and inspection, maintenance, renovation and preservation, demolition of structures – considering the technical, economic, environmental, aesthetic, and social aspects;
- “Technical beauty” or “civil engineering beauty” is the aesthetic concept behind the creation of technical products. “Technical beauty” contributes not only to the beauty of appearance but also to the usefulness of engineering works. Design for a specific function expresses the usefulness of beauty. Civil engineering can produce extraordinary works, which can reach the level of the works of art. In structural engineering, American scholar David P. Billington (1927–2018), who pioneered the field of structural art, established the “3E” principle for the beauty of engineering.<sup>20</sup> The first “E” stands for “efficiency” or minimal use of materials. The second “E” stands for “economy” or minimum cost. The third “E” stands for “elegance” and means maximum expression. There are many examples of the works of engineering that achieved the level of “art of structural engineering”;
- “Sustainable development” meets the holistic (spiritual and material) needs of the present without compromising the ability of future generations to meet their own needs;
- “Cultural landscape” refers to places that have been created, shaped, and maintained because of the connections and interactions between people and their environment.

In recent times, both authors continue to work on the aesthetics of bridges and have now entered the broad field of engineering and architecture of glass structures. Works on this topic include articles on the influence of colours on the aesthetics of bridges in Japan<sup>21</sup> and the concepts and innovations behind steel and glass architecture in Japan.<sup>22</sup> There have been many similar publications, also in the Polish “Świat Szkła” industry magazine devoted to glass, concerning – furthermore – the Japanese architecture of railway stations, airport terminals, passenger service stations on expressways, the aesthetic values of glass within the landscape, in interiors, and related to the

<sup>18</sup> Z. Cywiński, E.M. Kido, *Cultural factors of sustainability in structural engineering*, Structural Engineers World Congress Yokohama 2002, Abstracts P5-3-1, CD ROM, 6 pp.

<sup>19</sup> Eidem, *Urban bridge aesthetics: major challenge of the 21<sup>st</sup> century* [in:] IABSE 16<sup>th</sup> Congress, Lucerne 2000, Congress Report, pp. 14–15, CD ROM, 8 pp.

<sup>20</sup> D.P. Billington, *The art of structural design: a Swiss legacy*, Princeton, New Jersey 2003.

<sup>21</sup> E.M. Kido, Z. Cywiński, *The colours of steel bridges in Japan – principles and examples*, “Stahlbau” 2016, Jg. 85, H. 3, pp. 181–194.

<sup>22</sup> Eidem, *The new steel-glass architecture of buildings in Japan*, “Steel Construction” 2013, vol. 6, no. 3, pp. 229–237.



Figure 5. Fujisan – a philosophical symbol of the spirit of Japan

Source: photo E. Kido.

characteristics of the “architecture of materials”. Various problems of Japanese structural art became a special point of analysis in papers.<sup>23</sup>

Referring to the importance of culture in aesthetic design and its perception on the example of Japan, it is necessary to recognize the spiritual values of Japanese society – the soul of Japan<sup>24</sup> and its relationship to the landscape.<sup>25</sup> Japanese aesthetics especially value harmony, transient beauty and imperfection,<sup>26</sup> refined elegance and mystery, a way of acquiring and expressing abilities, strengthening spiritual superiority, excellence in skills and craftsmanship, warrior’s spiritual values, searching for truth to achieve goals, training and a desire for loyalty.

Traditionally, nature, and especially mountains, have great spiritual significance in Japanese culture and are often venerated as sacred places. Mount Fuji, an active volcano with a unique shape symbolizing Japan, is usually presented as a landscape, an object of religious worship and a source of artistic and aesthetic experiences. In 2013,

<sup>23</sup> Eidem, *Aesthetic perception of steel-glass architecture in Japan*, “Stahlbau” 2017, Jg. 86, H. 6, pp. 515–526; E.M. Kido, Z. Cywiński, H. Kawaguchi, *Tradition and modernity in the structural art of steel-glass structures in Japan*, “Steel Construction” 2021, vol. 14, no. 1, pp. 55–63.

<sup>24</sup> K. Mizuno, H. Mizuno, Y. Yamakuse, *Soul of Japan*, Tokyo 2015.

<sup>25</sup> H. Tanaka, *Japan’s beautiful landscapes – Japan’s soul*, Tokyo 2014.

<sup>26</sup> A. Juniper, *Wabi Sabi – the Japanese art of impermanence*, Tokyo 2003.



*Fujisan* was inscribed on the UNESCO World Heritage List as a cultural heritage site – “a sacred place and a source of artistic inspiration”. The external and impersonal nature, in its great variety of matter, represents the icon of Japan – the foundation of ideals, aspirations, desires and longings. It is assumed that the position of man in the universe is special. Spectacular *Fujisan* (fig. 5) is not only the highest symbol of the Japanese spirit, but also this Japanese sacred mountain – through the related *Tale of the bamboo cutter* – reflects the problem of the “immortality” of man. Today, similar ideas and references can be found in many places in Japan in the form of stained glass works of art (fig. 6). The motif of Mt. Fuji is the theme of Jiro Takihira’s stained glass *Japanese home, sunset, and cherry blossom in Tsukuba* (2005) at Moriya Station (fig. 6a). The second of his works touches on the subject of “Heaven” and “Earth”. This is the stained glass at Nagareyama-Otakanomori Station – *Grace of Heaven and Earth – the sparkle of flowers* (2005) (fig. 6b). Another stained glass, the *Creation of the Heaven and Earth* (1972) at the Tokyo Station, is based on a surrealist painting by Ichirō Fukuzawa (fig. 6c). The last example, the stained glass *Constellation* (1994) is located in the Pacific Convention Plaza Yokohama building. The work by Japanese painter Ikuo Hirayama refers to the image of the universe (fig. 6d).



Figure 6a–d. Stained glass works in Japan describing the nature and the universe

Source 6a–d: photo E. Kido.

Figure 6a. *Japanese home, sunset, and cherry blossom in Tsukuba*



Figure 6b. *Grace of Heaven and Earth – the sparkle of flowers*

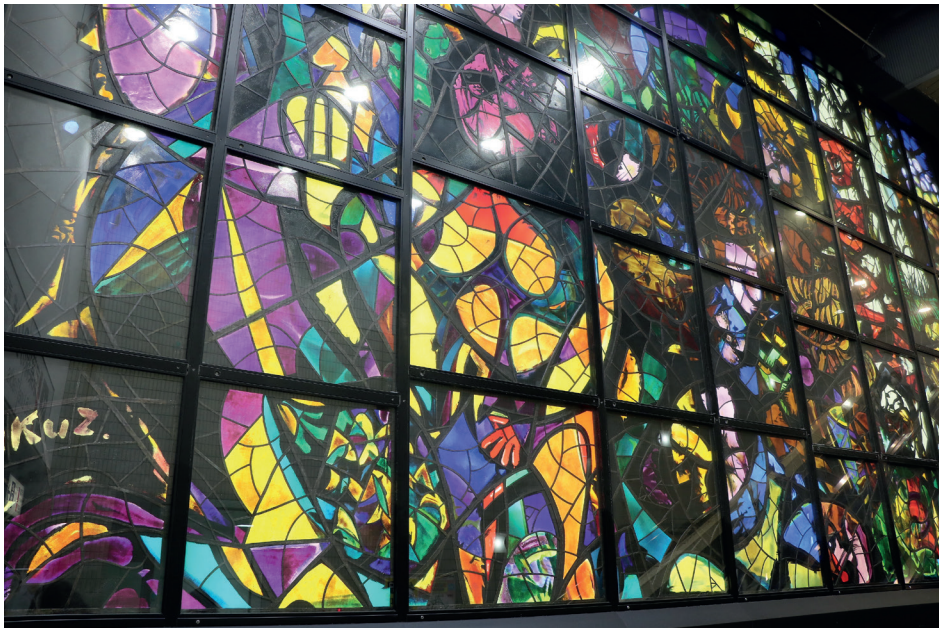


Figure 6c. *Creation of the Heaven and Earth*



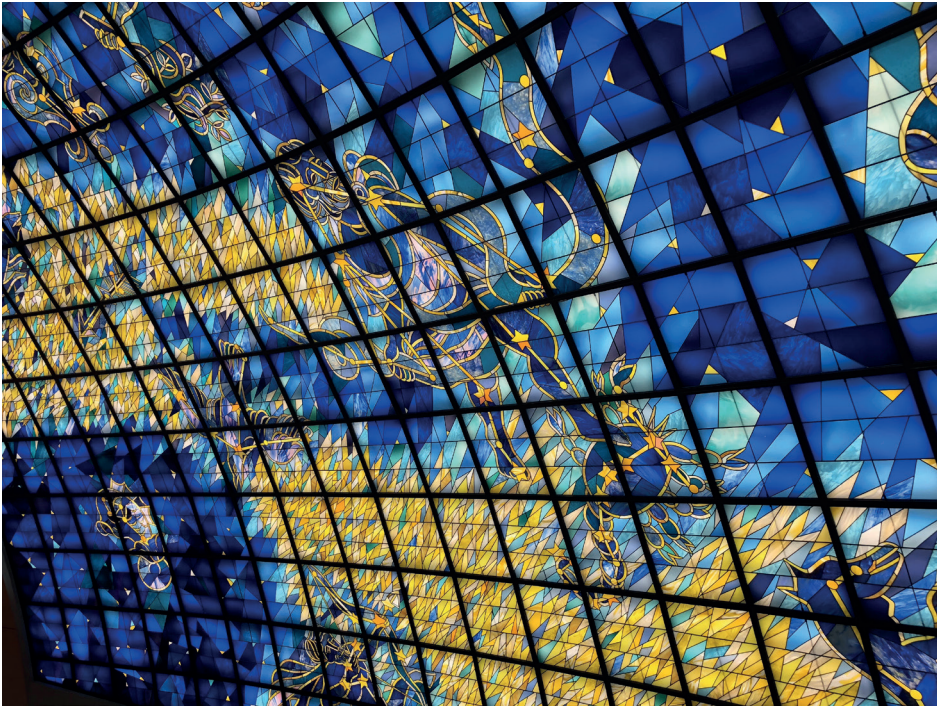


Figure 6d. *Constellation*

It has been proven that such attributes of Japanese spiritual ideals have become particularly characteristic also in relation to their practical implementation in architecture and construction. Such actual application is shown in figure 7. Modern architecture, which developed during the Meiji Restoration (1868–1912) based on Western techniques and styles, has since often been inspired by traditional aesthetics reflected in design themes, materials and construction techniques. A good example of modern architecture grown on historical roots is the complex of Tokyo Station (fig. 7a – new structures surrounding old ones). The station, which is located in front of the Imperial Palace, is considered one of the symbolic centers of Tokyo. Designed by Kingō Tatsuno, the Neo-Renaissance “Marunouchi Building” (1914) was restored in 2012 to its pre-war state and modernized (especially in terms of seismic resistance). The original brick and stone were used and a third story was added, which was missing in the post-war reconstruction. On the other side of the station, on the Yaesu side, three skyscrapers were built, among them the 200-meter-tall twin “GranTokyo” (2007) designed by Helmut Jahn. The central section on the Yaesu side has been replaced by a new, 240 meters long block, topped by a huge dynamic roof “Granroof” (2013), also designed by Jahn and Werner Sobek. One of the buildings surrounding the station plaza, which was completely renovated in 2013, is the Neo-Renaissance building of the Tokyo Central Post Office. This historic building (arch. Tetsuro Yoshida; 1931) was also completely rebuilt in 2012. A 38-story skyscraper

JP Tower (arch. Helmut Jahn and Mitsubishi Jishō Sekkei; 2013) was built on the top of the rebuilt headquarters (fig. 7b – new structures “growing” on the old). Another example is Tokyo Big Sight (arch. AXS Satow; 1996), an expressive structure consisting of four inverted pyramids covered in glass and titanium, surrounded by a variety of public art (fig. 7c – a showcase of futuristic lifestyle, next to the “Geo-Cosmos” display). It can be seen as a representation of a traditional *hōgyō* roof, which was a pyramidal style of roof built over a square building. On the other hand, it also represents a livelier, richer in detail and colourful trend in traditional Japanese architecture. It is located near the second futuristic showcase – “Miraikan” (National Museum of Emerging Science and Innovation; arch. Nikken Sekkei and Kume Sekkei; 2001) presenting a 6-m in diameter Geo-Cosmos.

Considerations for a better environment and traditional aesthetics have been extended towards a better urbanscape and have become the background for a new landscape design – *keikan dezain*, which was promoted since the 1980s by civil engineers and architects. Designers and planners grouped around academic institutions emphasized the need to preserve traditional Japanese townscapes and natural landscapes, as well as the need for comprehensive urban planning and design. Whereas the ultimate goal of the Modern architecture was to achieve synthesis, and its ideal image of architecture was a single and universal style, the ultimate goal of the Late-Modern and Postmodern architecture, was to manifest themselves as evocation of meaning. Many of the bridges also reflected great technical achievements. Particularly outstanding, from both – structural and visual points of view, were the bridges built between Honshu and Shikoku islands. Honshu-Shikoku Bridge Project involved three routes: Kojima-Sakaide Route (known as *Seto Ōhashi*), which was completed in 1988, *Kōbe-Awaji-Naruto* (1998) and *Onomichi-Imabari Route*, known as the *Shimanami Kaidō* (1999). Bridges on the first completed route, between Okayama and Kagawa prefectures, displayed very well coordinated design. Shimotsui Seto Ōhashi Bridge (fig. 7d – state-of-the-art technology with symbolic meaning), Hitsuishijima and Iwakurojima twin cable-stayed bridges, as well as the Kita and Minami Bisan Seto Bridges, had towers with geometric shapes resembling traditional Japanese motifs, and the overall design of this sequence of bridges was inspired by the rules of the Japanese garden. Product designer and academic, Kazuo Sugiyama, a professor of the Department of Industrial Design at Chiba University, was involved in their design.

Interests in the technical sciences and humanities were once expressed by world-famous Japanese architect Kishō Kurokawa (1934–2007), who applied various meanings to his architecture, including traditional motifs: “Advances in science and technology have blurred the previously clear-cut boundaries between life and death, man and machine – meanwhile, humanity awaits a new ethical agenda. The issue of some sort of symbiosis between mankind and technology [...], becomes ever pressing as we approach the new century.”<sup>27</sup> His architecture focused on traditional Japanese concepts, particularly those of materiality, impermanence, contradiction, ambiguity and space. For Kurokawa, life was a “small universe” and the parts of his buildings were rotating galaxies. Ehime

<sup>27</sup> K. Kurokawa, *Each one a hero, the philosophy of symbiosis*, Tokyo 1997.





Figure 7a–d. Japanese practical application of spiritual “longings”

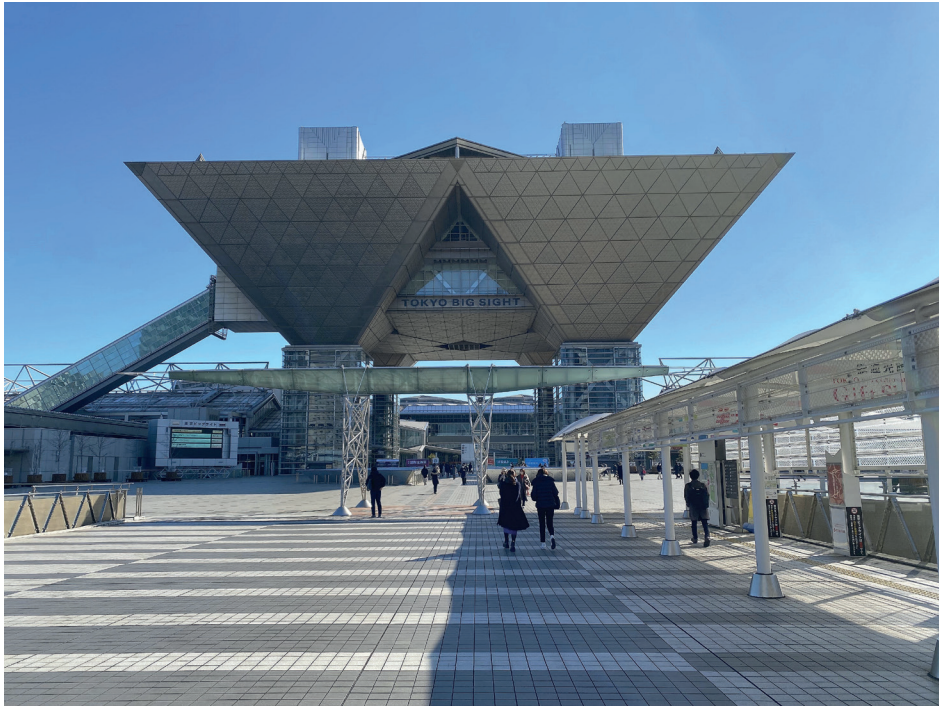
Source 7a–d: photo E. Kido.

7a. Tokyo Station



7b. JP Tower





7c. Tokyo Big Sight



7d. Shimotsui Seto Ōhashi Bridge

Prefectural Science Museum (1994), unlike Modernist architecture, consists of several independent parts. Each element of the building takes on the geometric shapes of a triangle, cube, sphere and semicircle, expressing abstract symbolism, also related to the Cosmos (fig. 8).



Figure 8. Ehime Prefectural Science Museum

Source: photo E. Kido.



Figure 9. Modern building in Tokyo

Source: photo Z. Cywiński.

Figure 9 shows a typical modern building in Tokyo, with delicate decorations between the shafts. All this, by direct contrast, adheres to the principles of the Japanese soul, interconnectivity, the “grey” space derived from Japanese tradition, where

interiors and outdoors meet, and at the same time – exposing the distant, mysteriously foggy sky – expresses what is understood as Cosmos.

### The heart of the matter

Engineering and architecture similarly to computer systems are founded on two sections, namely hardware and software. Both sections are necessary for the computer system to run but there are significant differences between them. Hardware is tangible; refers to the physical components that can be touched and seen. Software is intangible; refers to various programming languages, instructions that cannot be seen. Similarly in engineering and architecture, physical forms also require design concepts, various thoughts, and considerations.

After several years of research, the authors also concluded that there must be a science superior to both technical and humanities and other natural sciences. It turned out to be philosophy, that is, the love of wisdom.

Based on literature and studies, attempts were made to refer to the universal, transcendental values of philosophy that can be used in engineering. Authors' first step on this road relates to some statements made by the German geographer, naturalist, explorer and Romantic philosopher Alexander von Humboldt (1769–1859) in his book *Kosmos*.<sup>28</sup> The following thoughts can be found there:

- Humanistic values are inseparable from Cosmos and the related natural sciences;
- Cosmos means the subtly and harmoniously arranged completeness of the universe;
- There is a triad of composition: matter, the idea of Cosmos, and the aesthetic combination of spirit;
- Science begins only when spirit governs matter; Cosmos becomes a “portrait of nature”.

There follows a large variety of his thoughts concerning the relevant philosophy of life.

A second trace of comparable observations was shown by Cywiński in *Poezja i technika*<sup>29</sup>. He referred to an essay by the German engineer and writer Max von Eyth (1836–1906), published in 1904, which stated that since technology has been recognized as good, true, and beautiful, it is incomprehensible why it should be devoid of poetry.

As far as the ideology of this article is concerned, several books by the Polish professor of philosophy Michał Heller (b. 1936), winner of the Templeton Prize and founder of the Copernicus Center for Interdisciplinary Studies in Kraków (2008), present relatively complete ideas. Within its framework, a representative number of highly qualified scientists, including Heller himself, conducted significant scientific and philosophical research, bringing closer the “Great question” and the “Theory of

<sup>28</sup> A. v. Humboldt, *Kosmos*, Friedrichshagen 1913.

<sup>29</sup> Z. Cywiński, *Poezja i technika*, „Pismo PG” 2005, no. 5, pp. 43–44.



wholeness” – based on discussions on the cause of the universe and the ideas of spirit and matter in human life. For example, the following questions or statements were asked and discussed:

- “Why there is something rather than nothing” – first formulated by the German mathematician, philosopher and scientist Gottfried W. Leibniz (1646–1716);
- The scientific method cannot explain why the world is rational;
- The universe is built on the laws of mathematics;
- The rational method is deeply rooted in the world of values – the morality of thoughts, a part of ethics;
- Science shows the harmony of the universe, which is supposed to be the work of an Artist;
- The universe reflects an ingenious order in which harmony is the guarantee of truth. Accordingly, proportions and numbers become the principles of a nature that deserves to be called Cosmos;
- Beauty therefore turns out to be an important part of human nature, and art – the human spirit and culture;
- Poetry, like mathematics, has no boundaries – just like human imagination and emotions;
- When two mathematical theories confront each other, a new theory usually emerges, with both former appearing to be special cases of the latter;
- The general conclusion is correct that the problem solved raises new points, questions multiply, and the process of investigation continues.

The last conclusion is in line with the motto of this article – the Polish proverb – quoted at the beginning.

Among Heller’s own research achievements there are several important books which titles express his most important concerns and thoughts: *Encountering the universe* (1982), *Theoretical foundations of cosmology*, *Introduction to the global structure of space-time* (1992), *Morality of thought* (1993), *Science and imagination* (1995), *Eternity, science, cosmos* (1995), *Good luck in the space of Banach* (1995), *Quantum mechanics for philosophers* (1996), *Time and casualty* (2002), *Philosophy of nature* (2005), *Philosophy of random events* (2012). Behind all these simple titles is a great variety of very abundant contents; authors must leave here any additional comments.

It is clear that the actual view of Cosmos and the corresponding cosmology is based essentially on Einstein’s special (1905) and general (1915) theory of relativity. The authors expect that the short statements and thoughts presented above will suffice to obtain a conventional idea concerning the issues addressed.

Naturally, many new expressions and terms concerning Cosmos and the related philosophy, physics and mathematics appear here as special meanings, like: eternity, infinity, singularity, probability, non-linearity, etc. However, the question of space-time dominates containing, in addition, some nuances. Let us just show in a very popular way how the past and the future come together to meet in an infinitesimal limit – the

present moment. The theory of relativity destroys the concept of the present. Here the biblical word “I am he who is”<sup>30</sup> seems very timely.

In conclusion, the authors would like to emphasize that mathematics is the very heart of the discussed issues; it rules the entire real world in a universal way. As the first author wrote in his article, “[Man] will always be impressed by the beauty and logic of mathematics,”<sup>31</sup> it is unique – it is infinite and unchanging. Therefore, mathematics is “eternal”. In terms of human thought, the importance of mathematics can be summed up by quoting the very title of the book of the outstanding Polish mathematician Hugo Steinhaus (1887–1972): “Mathematics mediates between spirit and matter.”<sup>32</sup>

### Final remarks

The aim of this article was to show how different ideas and their inherent properties can be appropriately generalized, identified and interpreted. Hereby, the technical and humanistic sciences based on the creativity of designers were the starting point of investigation, and philosophy in wider sense – their final implementation. The contents of the relevant process is discussed, taking into account subsequent assumptions and conclusions, and its practical application is shown. By writing this paper, the authors also wanted to point out that every thinking can find its superior meaning – contained in the enormous abundance of human thought.

At the very end of this article, the authors wish to recall the following words of Hamlet: “There are more things in Heaven and Earth, [...] than are dreamt of in your philosophy.”<sup>33</sup>

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<sup>30</sup> Ex 3, 14 [in:] *The New Jerusalem Bible*.

<sup>31</sup> Z. Cywiński, *Technik w humanistycznym milieum. Kalejdoskop faktów i myśli*, „Rocznik Gdański” 2022, vol. 82, pp. 164–185.

<sup>32</sup> H. Steinhaus, *Między duchem a materią pośredniczy matematyka*, Warszawa–Wrocław 2000.

<sup>33</sup> W. Shakespeare, *Hamlet*, Lexington, Kentucky, 2018.

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### Summary

The main purpose of this study, treated as a kind of meditation, was to show the interconnections between various forms of human thought and those concerning real life issues – where spirit and matter interact. Hereby, the assumption was taken that the spirit – in order to achieve mature effects – should precede matter. In a feedback loop, predicted goals have a chance to become more perfect.

Similarly, the thesis was formulated and proved that each individual human domain can be considered as an element of a more general one – where philosophy can play the role of a “common denominator”. Such general statements were addressed in particular to the technical and human sciences – as well on native soil as in Japan – referring simultaneously to various spiritual attributes given to the Cosmos.

Key words: technical science, humanities, art, philosophy, Japan

### Streszczenie

#### *Ku filozoficznej medytacji o naukach technicznych i humanistycznych*

Głównym celem tego studium, traktowanego jako rodzaj medytacji, było pokazanie powiązań między różnymi formami myśli ludzkiej i tymi, które dotyczą rzeczywistej problematyki życia – gdzie duch i materia oddziałują wzajemnie na siebie. Przyjęto przy tym założenie, że duch – aby osiągnąć dojrzałe efekty – powinien poprzedzać materię. W ramach pętli sprzężenia zwrotnego pożądane cele uzyskują szansę stawania się coraz doskonalszymi.

Podobnie sformułowano i uzasadniono tezę, że każdą indywidualną domenę ludzką można traktować jako element pewnej domeny nadrzędnej – gdzie filozofia może pełnić funkcję „wspólnego mianownika”. Takie ogólne podejście zaadresowano szczególnie do przedstawicieli nauk technicznych i humanistycznych – prowadzących badania naukowe zarówno w Polsce, jak i w Japonii – powołując się przy tym na różne duchowe atrybuty nadawane Kosmosowi.

Słowa kluczowe: technika, humanistyka, sztuka, filozofia, Japonia