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HUMAN-FRIENDLY NEW WAY OF SEEING ARCHITECTURE

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Abstract. This article is written in the wake of the first wave of the COVID-19 pandemic to shake the world and stagnant systems. After COVID, nothing would be the same as it used to be. It is what it used to be, and we were hoping for a different turn of events. However, things will not sort themselves out. So let us take a look at what cannot do itself, but must be done in architecture and design in general.

Key words: architecture, urban planning, new directions, pandemic 2020.

Problem statement

The fiercest battles in architecture are always about beauty. Vitruvian on the Architecture of the Ten Books, the question of beauty is raised to the level of art. From now on, beauty will define the notion of architectural harmony and distinguish blandness and ugliness with a thick line from common construction and its forced construction.

Architecture is today a highly involved field of art. New directions in architecture, called after a new “architecture of care” (Tronto J., 1990), “upcycling” (Adrian Kręślik, 2020) or, finally, the well-known concept of “sustainable development”.

Sustainable development, sustainable architecture, sustainable design – these are several terms used. One long-known problem of designing that does not burden the natural environment and its organisms are still under discussion.

People included, too. This article is written in the wake of the first wave of the COVID-19 pandemic to shake the world and stagnant systems. Nothing was supposed to be the same again.

Locked in our homes, hidden from the pandemic, we watched dolphins entering Venice on TV and pictures of Milan from 2008 with smog and from 2020 without smog. They looked like pictures from ads for weight loss products before and after putting on weight. Is there any hope that the cumulative actions of the climate strike and the 'Generation Z' rebellion by Greta Thunberg (Zuzanna Kasperczyk, 2020), dramatic appeals of experts from climate summits, states' commitments to reduce CO2 emissions and reduce human impact on rising temperature and water levels together with actions individuals, who are sometimes affected by the consequences of climate dramas, will allow for radical changes in thinking about space, planet, and design?

We are architects. We focus on designing and solving design and aesthetic problems. Now we will also have to take into account the issues that we will describe below.

Objective of the article

After COVID, nothing would be the same as it used to be. It is what it used to be, and we were hoping for a different turn of events. However, things will not sort themselves out. So let us take a look at what cannot do itself, but must be done in architecture and design in general.

Aleksander Krajewski, in an article written for “Autoportrait”, with a title that says a lot about the content of the same “Archifrustrations, or what an architect can do for the climate”, between pouring out design frustrations on the reader, points out in points (with which we agree and some we decided to update or slightly remodel) how to design to save the world from climate destruction.

These demands are:

1. Respect the air,
2. Respect the water,
3. Learn,
4. Reuse, recycle, revitalize
5. Make your building lighter,
6. Forget about coal (at this point the author wrote “COP24 Summit in Katowice. Let us celebrate this event with a minute of silence”),
7. Eliminate the coefficient of the minimum number of parking spaces,
8. Be consistent.

Results and discussions

In our opinion, the topic requires extensive commentary. We would also like to add a little bit of ourselves. Starting all over again.

The author of the counting sheet is an architect, social activist involved in designing on an architectural scale and the scale of public space planning.

The watchwords he discussed in Autographs concerned architectural design on an architect's scale. We would like to include a fairly complete list, add a few requirements for urban design, analyze the possibilities of creating a climate, and open the field for cooperation with specialists in materials science and installation.

1. Respect air, respect water.

The relationship is obvious. Higher temperatures, greater amplitudes, less water, greater water losses, greater energy consumption. Worse climate, more disease, serious consequences for the planet. Water runoff from the area that should be retained, uncontrolled droughts, uncontrolled floods.

So let us start from the very beginning.

Krakow boasts the liquidation of 43.6 thousand boilers and furnaces using solid fuels. The number of days in which the pollution exceeds the already high standards of harmful substances concentration per year is still over 200.

First of all, electricity, as the cleanest source of energy, should be the basis for powering a modern city. People living in urban areas are exposed to a much greater risk of being exposed to the need to function within heat islands than those living in non-urbanized areas. The heat island effect is already widely analyzed in the literature and elaborated on in detail.

Secondly, we should design the city with an opportunity to improve its climate conditions. temperatures are a huge challenge, especially in tropical climates, although a mild climate, like our native one, poses a significant threat to inhabitants suffering from the effects of prolonged, high temperatures.

Several experiments have already been carried out on how the geometry of buildings should or should not look like to produce certain effects like ventilating the city sufficiently, controlling temperature rise, reducing discomfort, etc. Overall, the results of the research suggest that the choice of geometry and diversity of buildings has a huge impact on the final (artificial) climate in the city.

Significant points in discovering the city: outdoor and light cooling as well as energy consumption, objects are noticeable to the naked eye. It is vital to check that traditional types of buildings with different heights and volumes, with a smaller number of floors and their form, have a significant impact on the external and internal conditions of the neighbouring buildings. Modifying the urban geometry and diversity in its assistance allows us to generate a local climate and avoid heat islands.

So let us show you few examples.

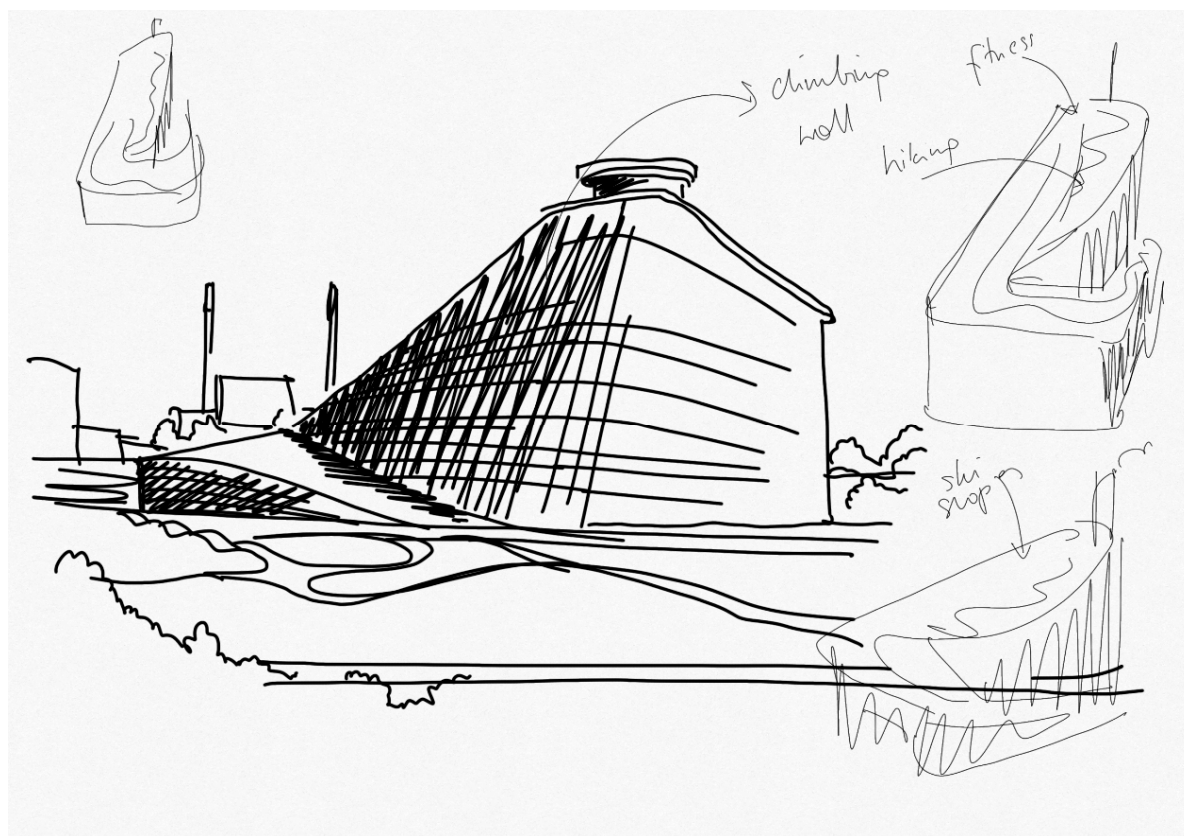


Fig. 1. Copenhill: ski slope, climbing wall and street fitness on BIG's waste-to-energy plant in Copenhagen

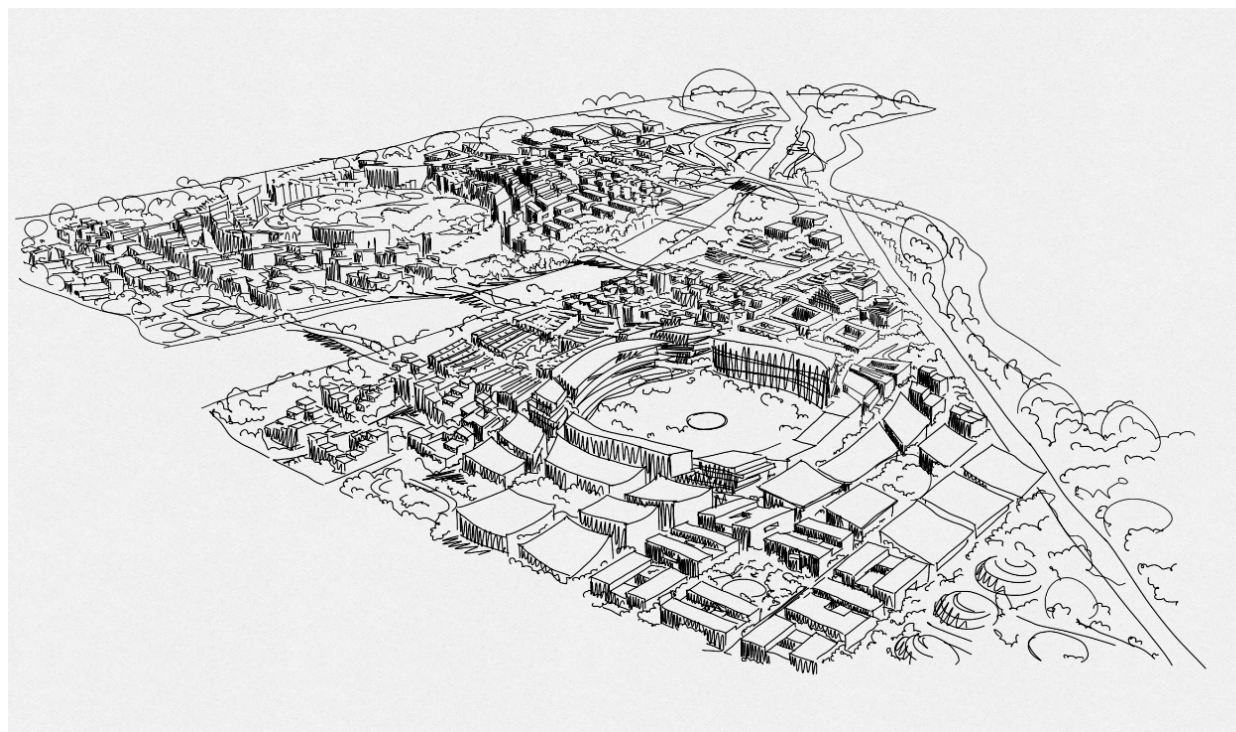


Fig. 2. Toyota Woven City, the World's First Urban Incubator

We should take into account the opportunities offered by the knowledge and skills and the use of technology. It is about materials, their assessments, and designing the use of materials in such a way as to derive the most profitable benefits from the construction process while generating the smallest losses and damages.

2. Future cities.

We are waiting for the repair of the existing world and the revitalization of historical cities in terms of energy. Poland is not chasing Western Europe, but rather dignifiedly stomping, and the concepts of zero-emission architecture are still distant design activities of BIG, such as Copenhill or Woven City.

Somewhere in the western world, urban revitalization is combined with man and nature. Greenery is an integral part of it, and renewable energy is the basis of its functioning. New trends in modern architecture assume the necessity to use such opportunities that do not threaten energy stability. Europe and the commitments signed impose a significant reduction in CO₂ emissions. Now we have the motivation and framework for action in the subject of global climate change, so the only thing left for us to think about is designing the cities of the future, or rather redesigning them so that they become still habitable in the future. We must focus on the future and how we should respond to regeneration planning and plans. We need to find a new space for research and discussion. We cannot allow our cities to expand freely horizontally. We have to start thinking about their vertical construction, but taking into account the parameters determined by the necessity to limit the heat islands and the canyon effect.

There is much to think about and do. Architects, as creators, on the one hand, erecting monuments to the power and capitalism, and on the other hand, awarding each other the PRITZKER awards for activities for the benefit of local communities and architecture at the highest possible financial cost and environmental consumption, along with growing the 'Generation Z', concluded that the right to life may soon become a luxury..

3. Learn from the wiser. Learn from other's mistakes and successes..

The opinion we would like to quote from this speech by the President of Rio de Janeiro, Eduardo Paes. There is no city design without the participation of politics, and we would like to comment on it. "Four Commandments for Cities" [9]. This speech is a monologue of a man managing a city with a population of 6 million, whereas 20 % of people are favela residents. Paes advises that you do not have to be wealthy or powerful to make smart changes. We do not agree with his statement, but we agree with the others, for example, the thought to always use smart solutions that have already worked elsewhere. So let us present four opinions of President Paes' speech.

1. The city of the future must be environmentally friendly.
2. The city of the future has to deal with mobility and integration.
3. The city of the future must be socially integrated.
4. The city of the future must use technology to be modern.

The space of the city of the future must be a safe and pleasant living space. Going a step further, in the work of architecture and urban planning, we must take into account not only aesthetic, sociological, and economic aspects, but future-oriented activities, not preventive, but rather pro-development.

4. Reuse, recycle, revitalization

In the long term, revitalization and modernization are better for people and the environment than the use of non-modernized facilities and space (Sonetti G., 2020). Edward Willson writes about unrestrained urbanization, ruthlessly announcing: half of the Earth should remain beyond human reach]. We were ruined by treating the Earth as a source of raw materials (Wilson E. O., 2017).

In our opinion, another notion worth mentioning was introduced into the literature. Well, it is a RESOLUTION.

Resettlement is a concept introduced by a researcher from Cumbria (UK) who has spent years dealing with strategies development for companies, including a strategy for the United Nations. "Deep adaptation" or "resilience" is the process of adaptation to adversity, trauma, tragedy, threat, or high stress such as family and partner crises, serious health threats, or stress related to work and financial situations. It means "recovering from a difficult experience" (Shiva V., 2020). The concept is significant for us (people who need to adapt to the world they live in) and will always be considered on a global scale. The most important thing will be "thinking

about the community of the future” (Katarzyna Szpicmacher, 2020) and recognition of our total dependence and interdependence with nature and the processes that take place in it.

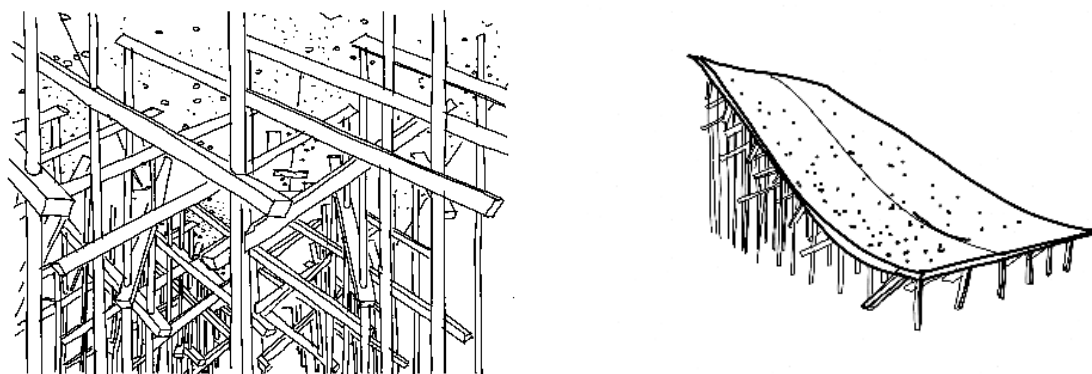


Fig. 3. MYCOsystem by Małgorzata Gurowska, The Polish Pavilion at the 22 International Exposition of La Triennale di Milano

5. Make your building lighter.

Who needs contributing such huge amounts of concrete and forces into a single-family house as for a bunker to fit two adult people, one child and a dog?

Of course, we can think about literally weight loss for building. That is, slimming the structure, reducing weight, load, etc. However, we believe that we should also think on a new approach to design – from the point of view of making a lighter imprint on the surrounding landscape and ecosystem.

Is how we came to the MYKO system. This is an exhibition from the Milan Design Triennial, shown in 2019. The installation consisting of wooden sticks, as we are thinking about it now, is to show the possibility of thinking about architecture differently than before. From the point of the authors' view, its modular, reusable, and inconsistent character should refer to nature. We are usually thinking similar to the idea of the authors of Lego blocks. Here we have wooden toothpicks. The possibility of assembling elements without the need for their permanent assembly seems completely innovative here (Bendell J., 2020).

6. Forget carbon.

In 150 years the known non-renewable energy sources will end. We will die out without them. The reason why we do this starts with the planet we live on – the only habitable planet we know.

As humans, we seriously shake the balance of nature, endangering our future, or at least the future of coming generations. That is why, unlike the generations of planners, architects, and engineers before us, in our work, we have to face and solve three challenges related to sustainable development. The first is climate change: it is already happening, and we cannot stop what our parents and grandparents have caused. So we have to be prepared for extreme weather events. Running out of fossil fuels is a challenge: we may be able to postpone the fossil age of another human life, but it will end anyway. And if we want to avoid extreme climatic events, we must completely switch to clean renewable energy sources. The problem is also the scarcity of other resources: many resources are running out.

Natural causes and geological cycles cannot explain this rapid change. With probability bordering on with certainty (95 %) the IPCC, representing thousands of climatologists, states that exacerbated climate change is caused by greenhouse gases, mainly emitted by human processes. Estimates vary, the existence, temperature on Earth will most likely increase by 1.5 to 5 degrees this century, depending on the action taken or not. All scenarios will have consequences, some very severe. Therefore, climate scientists are calling for urgent action. There is one more reason why we should move away from our current centralized fossil fuel energy system.

It is the most important social reason for energy neutrality. The carbon footprint of all countries in the world is shown on the www.worldmapper.org website (George Crabtree, Elizabeth Kocsc, 2014).

The map shows an obvious conclusion. The Western world becomes responsible not only for the greatest damage to the natural environment and reducing the possibility of life on earth, but is also responsible for its repair and introduction of new standards of contemporary design and thinking about people and the natural environment. The Paris Agreement has been signed by 150 countries. CO₂ emissions must be reduced. Energy sources are entirely transformed into renewable energy sources.

We have got a position on this matter by one of the biggest perpetrators of the climate tragedy (the construction sector), consuming 30 to 40 % of energy. The assumption is that we will be carbon neutral by 2050. To achieve this goal, we must not only learn to design zero-energy buildings but also transform those already existing into energy-neutral.

Better World published a list of the 10 greenest cities in February:

1. Reykjavik – 95 % geothermal energy and 100 % renewable energy.
2. Zurich – 75 % renewable energy.
3. Bristol with a reduction of energy consumption in homes by 16 %, by 2020 reduction of CO₂ emissions by 40 % and by 2050 to 80 %.
4. Portland – 33 % renewable energy, electric bikes and carpooling.
5. San Francisco, as one of the greenest cities, with a high ecological standard of energy use in construction, public transport, etc.
6. Vancouver by the end of 2020 assumes 100 % renewable energy and a comprehensive green city plan: energy, transport, buildings, clean water, and “zero waste”.
7. Malmo, assuming that the entire city will use energy from renewable sources by 2030. Appropriate spatial planning, reduction of gas emissions, transport optimization.
8. Copenhagen: aims to be carbon-free by 2025 and cut emissions by 50 % from 1995.
9. Stockholm: 1,000 parks and 12,000 trees in the city centre, commitment to being fossil-free by 2050. 95 % of the inhabitants live 300m or less from the greenery.
10. Oslo has the lowest CO₂ production in Europe, awarded as a sustainable European city in 2003, and titled the greenest and friendliest city in the world.

Now we came to the bottom of what we would like to write about and what to focus on.

Western universities are introducing zero-emission design courses for students, even available on remote education platforms. In Poland, however, this practice is still treated as a fashion fad. We design buildings that are more economical but in the production process. We count PUM, earn money on the construction site per square meter of an apartment, trying to make a concrete cheaper, regulate rivers, destroy the ecosystem. In cities such as Krakow, where a large part of the city fights for the right to green life, creating grassroots greenery conservation movements and associating students of architecture departments in organizations such as “more concrete in Ruczaj” (Ruczaj is the name of the estate), you can already feel what we should take for the norm. When a city is the owner of the land, not only a control body, it has a greater influence on planning activities, it can set conditions, requirements and regain control over the implementation of buildings based on city development plans. We are now returning to the considerations on the necessity to divide or consolidate land, which is of social importance in the times of climate and ecological crisis. Leaving the aspect of caring for the environment and the awareness of such a necessity to the city authorities would be naive and a continuation of the fatal practice. “You have to fight for the right in democracy” an interview with Joanna Kusiak, in which she states that “Urban planning monopoly” in Sweden (Stockholm owns 70 % of the land within its borders) without taking into account the will of the developer or a private owner can introduce top-down rules leading to sustainable city development.

Meanwhile, in Poland, Paweł Hałat writes: “Although the interdependence of space, economy, and society seems obvious, one of the greatest deficits in development planning has been for years the lack of linking spatial policy with the so-called socio-economic planning (which includes strategies). Strategies of

territorial units are created independently of development plans, at different intervals, based on separate diagnoses, procedures, and consultations. These documents, full of formulas about sustainable, intelligent, compact, low-carbon development and increasing the quality of life, thus become a collection of wishful thinking in the face of sprawling buildings and the growing number of cars. Similarly, projects included in development strategies – without specifying the place of their implementation – become only a paper record, and big words about metropolitan ambitions pale in the face of the chaotic space around strategic urban investments”. This is how Hałat writes about the Krakow Tauron Arena.

Let us look at the Scandinavian and German patterns. The issue of sustainable development and the introduction of solutions that work in practice is implemented much better there than in Poland. On May 14, 2020, the Ministry of Climate presented the Committee for European Affairs with a plan to reform the electricity market. The plan covers topics such as balancing market, Demand Side Response (retail market, grid expansion, reduction of allocation, and cross-border connections). The subject is long and we would not necessarily want to focus on it. We can easily assume that of all the possibilities of using renewable energy, we choose the solar one, also produced locally. Looking at Germany, which is the undisputed winner in the European competition for energy solarization, we conclude: more ambitious spatial planning involves taking into account minimum energy goals while minimizing CO₂ emissions (Trias Energetica process and industry collaboration). Energy is the one that we do not use, so it is necessary:

- to reduce gross energy demand;
- to cover the demand with sustainable energy from renewable sources;
- if this is not possible, to optimize the use of fossil fuels (Olaf Bruun Jorgensen, 2018).

To ensure the design and functional consistency, it is possible to apply IED, i.e. Integrated Energy Demand, adjusting the building design: its orientation, location, functions, and shape to the surroundings and its parameters. Thanks to this process, we can afford the optimal use of the investment space, minimize the energy demand and the use of sun and daylight. The use of 3D modelling plugins (UrbanSOLve) allows you to quickly estimate the passive and active potential of the sun and create well-thought-out design alternatives at the initial stage of investment planning. We mentioned earlier about the revitalization process and the fact that urban areas are characterized by a strong influence on the energy of neighbouring buildings. The positive or negative impact they generate will have far-reaching energy, economic, and climate consequences. However, we must briefly point out, because the topic is inexhaustible, about the need to introduce a new standard for the use of prosumer energy. The concept of prosumer energy functions in the legislation, and we should take into account the necessity of such a sustainable design that takes into account the need to produce distributed energy and its use as a better replacement for the currently used central one based on coal. Architectural design should take into account the carbon footprint, the economic aspect of the design and construction of the facility (or facilities), and take into account the need to use integrated energy production systems with the structural and facade elements of the building. Instead of thinking about energy as an additive, it's time to think about design comprehensively.

7. Reducing the number of parking spaces

How to create an apartment-friendly space? Not necessarily building an unlimited number of parking spaces. The number of passenger cars used by city dwellers exceeds the capacity of car parks. The city, as a space created for residents to live, consists largely of asphalted roads for cars and parking lots.

Electric scooters, bicycles, and short-term rental cars are investments that are much more attractive from the financial and ecological point of view. Also when it comes to landscaping. The city must take this into account when limiting the concreting of the ground. Space must be habitable. It's called a “liveable city”. Lectures are already being conducted on the edX educational platform. What to consider when designing a new city? How to think about the city's growth while limiting its growth? During the lectures on “Cities Suitable for Living”, these aspects of life and factors are disclosed:

– possibility of earning money is taken into account, i.e. the economic aspect – so important and conditioning to be or not to be in the urban space;

- attractions that space offers;
- the ability to function comfortably in a breathable, clean environment that does not cause serious diseases and premature death.

Let us start with urbanized space. If we were to analyze the development of the urban organism itself and how it came about that most of us live, and despite the COVID pandemic and technological possibilities that were to replace traditional face to face models, people still need contact with other people. We will not cite literature from the canon of school reading about epidemics and the need for contact with people now, but we would like to mention the book “Delirious New York” by Koolhaas because the association of this book is of little value when it comes to the aspect of the theory of space construction (because it deals with their extremely distorted mutations) will be most appropriate here. The city of New York and its history is described as laboratory modernity and a space-sociological-entertainment experiment. In addition to the history of the mathematical accuracy of the road mapping and rapid expansion periods, we are reminded by the description of the surreal world in entertainment from – ATTENTION! – artificial lights, with which you could also take a bath in the river at night. New York is becoming the entertainment capital for residents and caricatured makes artificial what was needed in the 17th, 18th, and 19th centuries for the inhabitants of the New World. Artificiality was what attracted the villager to the city.

A city dweller needs work, entertainment space, attractive space, very competitive in analyzing green fields and forests. Workshop competitions can make money or lantern. Modernity as a synonym of attractiveness will always be a catalyst (Rem Koolhaas, 1997). One can, of course, go further and condemn the state of using the possibilities of a technological step by cities for their natural character. Drawback some land in the middle of the city itself to Earth. Nowadays, modernity is a return to nature. Reusable thermos cups instead of polystyrene, but still concrete, fenced housing estates – instead of wooden huts with rainwater tanks.

What can you do for good examples of already implemented projects?

Bring wetlands to the use of plants and worms, thus create natural retention spaces (London, Queen Elizabeth Olympic Park), green river banks (Sutcliffe Park) and geometricize smooth, concrete descents into the water (Kasper Jakubowski, Sztuka Przetwarzania, 1997). Can be made renewable to cities. Revitalize buildings that generate large energy losses. To hand over some of the built-up areas in the city centre to the management of greenery.

In our Polish area of a moderately prosperous Central European country with a moderate climate (although it causes a continental climate to a greater extent), we should focus on the maximum division of dispersed energy sources (solar).

Conclusions

The process of urban planning is very complex, just like architectural design, but today we are talking about a different scale of the design. Our main goal is sustainable design, good neighbourhood, and optimal use of energy and opportunities offered by technological progress. Planners, town planners, and architects have to deal with many aspects simultaneously. In Germany (the country we are taking as a model), planning is carried out in strongly overlapping phases and approaches this process interdisciplinary. Assessing the situation, detecting a problem, setting goals, determining the scope of planning, the planning itself, the implementation phase, and monitoring and evaluation of the plan implementation are subject to consultations not only from the industry but also from the public. Thanks to the morphological analysis, urban planning allows for the optimized use of wind energy and sunlight. A good city plan or a revitalization plan introduced in terms of energy optimization will affect the air temperature, limiting the canyon effect, the health of its inhabitants, and the comfort of functioning in it. “The best energy is the energy that we don't use” (Giulii Sonetti, 2019).

The approach to design changes with the introduction of modern planning methods and the available tools, knowledge, and awareness of experts who design space – an interdisciplinary approach, professional responsibility, and design ethics interpenetrate like never before, creating modern models of trying to save the stagnant world.

The demands of the generation with great awareness of the climate threat, the generation facing the destruction and degradation, become the basis of sustainable design ideas and must set the direction of our view.

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ДЛЯ ЛЮДЕЙ – НОВИЙ СПОСІБ БАЧИТИ АРХІТЕКТУРУ

Анотація: Ця стаття написана після першої хвилі пандемії COVID-19, яка приголомшила світ та застарілі системи. Після COVID ніщо не було б таким, як було раніше, однак потрібно зрозуміти, що саме потребує змін. У ній проаналізовано, що світ змінитися сам не зможе, пропонується як повинен далі працювати архітектор та дизайнер, а також визначено основні напрямки розвитку містобудування.

Процес містобудування дуже складний, як і архітектурне проектування, але сьогодні ми говоримо про інший масштаб проекту. Головна мета дослідження – це аналіз стійкого дизайну, добросусідські умови та оптимальне використання енергії та можливостей, які пропонує технологічний прогрес. Планувальникам, містобудівникам та архітекторам доводиться мати справу з багатьма аспектами одночасно. У Німеччині (яку ми досі приймаємо за модель) планування здійснюється на фазах, що дуже перетинаються, і підходять до цього процесу міждисциплінарно. Оцінка ситуації, виявлення проблеми, встановлення цілей, визначення обсягу планування, самого планування, фази реалізації, а також моніторинг та оцінка виконання плану підлягають консультаціям не тільки з боку галузі, а й з боку громадськості. Завдяки морфологічному аналізу, містобудування дозволяє оптимізовано використовувати енергію вітру та сонячного світла. Хороший план міста або план ревіталізації, введений з погляду енергетичної оптимізації, вплине на температуру повітря, обмежуючи ефект каньйону, здоров'я його мешканців та комфорт функціонування в ньому. Підхід до проектування змінюється з впровадженням сучасних методів планування та існуючих інструментів, знань та обізнаності експертів, які проектують простір. Міждисциплінарний підхід, професійна відповідальність та етика дизайну взаємопроникають як ніколи раніше, створюючи сучасні моделі спроб врятувати застійний світ.

Вимоги покоління, яке добре усвідомлює кліматичну загрозу, покоління, яке стикається з руйнуванням та деградацією, стають основою стійких дизайнерських ідей і повинні визначити напрямки, у якому ми будемо шукати.

Ключові слова: архітектура, містобудування, нові напрямки, пандемія 2020.