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**Małgorzata Litwinowicz-Drożdziel**

# Scant transparency, plenty of hindrance. The 19th century, exhibitions and instruments of observation

**translated by Jan Szelągiewicz**

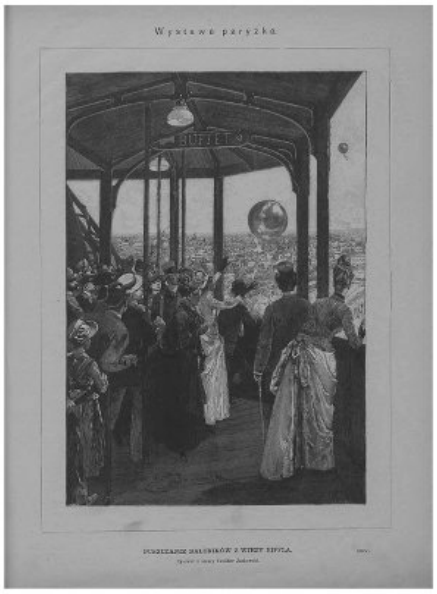
In 1890, *Kurier Warszawski* [*The Warsaw Courier*] reported:

> After the Exposition Universelle reached its close, thousands of panoramas were distributed all across Europe to bring a little joy to those who could not attend the Exposition in Paris in person. Yesterday, one such panorama was unveiled to the public at Nowy Świat. It employs cutting-edge technology and is very practical: it seats a couple of dozen of spectators simultaneously. Photographs used in the panorama are colored.[1]

Saying that exhibitions were fairly popular in the 19th century is a gross understatement – the above passage from the *Kurier* clearly indicates that the act of organizing and attending exhibitions has itself become the subject of exposition and observation. To some extent this further reveals the nature of the exhibition, itself a narrative describing a particular structuring of the world. This kind of vision is also supremely self-referential, as the "panorama of an exhibition" is not an abridgement or an abstract of the exposition itself, but a practice turned inwards. Pictures of attendees, also featured in the Warsaw panorama of the Paris expo, are a recurring theme in the background of many 19th century newspaper photographs and illustrations. They become the object of the reader's attention to an equal (or even greater) degree as the showpieces themselves.

A number of practices sprang up around the 19th century exhibition, including travel, the development of guidebooks, plans and catalogues including their proper usage with chronicling (of notes, jottings, press releases, letters, telegrams, postcards) and organization (especially self-organization, a very important aspect of exhibitions in smaller population centers). Exhibition practice in the 19th century was nearly ubiquitous; it was much more than just the sum of the most popular and

renowned ventures like international exhibitions in London, Paris, and other major cities in Western Europe and the United States and the accompanying beacons of modernity such as the Crystal Palace (London, 1851) and the Eiffel Tower (Paris, 1889). In Poland, the best known (if known at all) events of that sort were definitely the 1894 Polish General Exhibition in Lviv, associated primarily with the Racławice Panorama, and the 1929 Polish General Exhibition in Poznań. However, a plethora of other exhibitions – with themes like agriculture, antiquity, industry, hygiene, women in the workforce and many others – were organized in a host of smaller cities including Kalisz, Ciechanów, Łowicz, Radom, Šiauliai, Radzyń, Radzymin, and Miechów, making it nearly impossible for anyone to attend each and every exhibition organized within the former borders of the Polish state in the 19th century.




***Tygodnik Ilustrowany* [*The Illustrated Weekly*], visitors at the Eiffel Tower**

Regardless of whether or not these endeavors were successful, regardless of the impression they made on organizers, attendees, and critics hailing from Warsaw – if press reports are to be believed, opinions were often divided - their ubiquity and the somewhat aggressive nature of the exhibition mania surely changed the context for the experience of exhibitions. We can presume that the ubiquity of exhibition practice led to an examination of human relationships in terms related to goods and services. Indeed, the exhibition became a perfect metaphor for the human experience itself: the compulsion to observe and the terror of being observed. The act of observing, watching and exploring was acknowledged to be a separate, distinct activity only in the second half of the 19th century – for the first time in the history of modern Europe, possibly for the first time in such a scale. After that, it no longer needed to be concealed under various names, no longer had to be connected to another activity. One could now walk/travel/move/leave home/organize one's schedule for the *sole purpose* of seeing, regardless of whether it was to see the world expo or to window shop, that is to enjoy the possibilities brought forth by the guiding principle of the age of steam and electricity: transparency. Around 1850, achieving that dream finally became technologically

feasible. Organizers of countless exhibitions in the late 19th century usually wanted reality, structured according to the precepts of exhibition organization, to imitate the Crystal Palace in London. The world was supposed to seem as if it had nothing to hide, no multiple, complex layers, and no dark nooks where the unpredictable and the disorderly lurked.

I am writing about these well-known and fairly obvious issues to bring up and demonstrate the fact that such culturally defining moments often involve the appearance of those emanations of transparent modernity that numerous writers, including Douglas Murphy, have described in their work: not only exhibition palaces but also train stations, shopping passages, department stores, and orangeries/winter gardens.[2] Their development was made possible by advances in metallurgy (molding, ready-made structural elements) and glass-working (huge plates of tempered glass). They became the sources of a new sort of visual experience and the embodiment of a certain desired *modus* of seeing. Not only did it presume a perceptive, *penetrating* gaze capable of pulling what is hidden to the surface, it postulated a gaze that establishes an object that it thoroughly subordinates – nearly always a relationship of power in which there exists only what is brought into existence by the very act of watching. Did transparency, however, remove all the obstacles it was supposed to?

## Light and Vision

In *Rozprawa o ciężarze światła* [*A Treatise on the Weight of Light*, 1837], Aleksander Chodkiewicz wrote:

> &.1. What we consider light is a liquid ever brilliant and subtle which impresses upon our organs of sight what we call brightness.
> 2. What would that liquid, capable of making objects visible to our eyes, be in its essence and in what form would it exist in the places it dwells? – no one has yet found answers to these questions and they may remain so forevermore [...][3]

Chodkiewicz added that in order to measure the eponymous weight, one needed precise scales, accurate measuring devices, tares and glass cylinders. He may seem somewhat similar to Michał Wereszczaka, the lord of the Płużyny estate immortalized by the bard's ballad, he who "had instruments made in the nearby city

and lavished large sums upon the matter." He established his laboratory in Warsaw, in a house on Miodowa Street - having a private residence furnished with laboratory equipment and conducting scientific studies outside of recognized research institutions or universities was nothing out of the ordinary in 19th century Europe. The author of *A Treatise on the Weight of Light* also ended up earning his place in the history of Polish science - together with Śniadecki, Chodkiewicz is considered the architect of Polish chemical terminology. He also produced the first modern chemistry handbook written entirely in Polish (the seven-volume edition of his *magnumopus* was published between 1816 and 1818), and was a renowned fellow of the Warsaw Society of Friends of Learning. Chodkiewicz's treatise itself is much more than just a tale about the "exotics of the 19th century" and an experimenter who, in a fit of romantic exaltation, decided to weigh light itself.

In the 1830s, the wave theory of light was not all that well-established; only research conducted 30 years later by George Maxwell finally elevated it to the place it still holds today. Chodkiewicz frequently cited the work of a French chemist Jean-Antoine Chaptal, while the deliberations of Count Aleksander himself and his fascinating attempts at proving that when light illuminates an object it increases its mass and then moves elsewhere could not in any way be considered fringe science in that particular era. Chodkiewicz believed that light itself was a substance that reacts with other substances. He writes on that subject extensively in his *Chemiia* (*Chemistry*): lux is described in the chapter on "elementary bodies" ("that is bodies which heretofore did not yield to our efforts to split them").[4] Like the caloric, lux was supposed to be omnipresent: elastic, mobile, and material (and therefore endowed with mass). It was supposed to be an elementary body, but not quite-passing through a prism cleaved it into its constituents, so only the latter could be considered elemental in nature. In *Chemiia*, Chodkiewicz described the reactions of lux with other substances, but all of his observations and conclusions are rooted in one key precept: that light/lux is a substance and its examination should be the domain of chemistry. So, some optical phenomena would be considered chemical reactions, according to today's definitions.

A host of questions still remained unanswered: What is the nature of light? What does it mean to see? Where do images come from? Do we all see in the same way? What is color? The list was much longer than that and the following decades brought forth both new explanations (in the form of increasingly complex theories

elucidating the nature of the world and its laws) and complications (in the form of the latest inventions of the era, including those used for the purpose of capturing and creating images). It seems that in early 19th century, studies of optical phenomena and visual perception were a source of cognitive anxiety, while the inability to irrefutably distinguish between experiments and parlor tricks, between natural phenomena and illusions, inspired tremendous uncertainty.

E.T.A. Hoffman's *Sandman*, a short story published in 1817, is an excellent example of how intense that anxiety could get. A visit from an itinerant optician of which Nathanael, the protagonist, tells his friend Lothar in a letter, is from the very beginning marked by fear and terror. The work of the optician bears an obvious resemblance to alchemy, eye and sight become one and the same; the sensory organ and the experience become indistinguishable from one another, as do the medium and the object. The optician, appearing alternately as Coppelius or Coppola, sells optical instruments that become gaze itself. In Hoffman's short story, spectacles themselves *see*, the telescope shapes the image it magnifies and, as it turns out, the aided eye does not see better nor is it better separated from the object it observes. When Coppelius-Coppola suddenly announces that he also has eyes to sell, the horrified Nathanael tries to immediately cut the intrusion of the optician short:

> "Madman, how can you have eyes? Eyes?" But Coppola instantly put away his barometers and, thrusting his hands in his wide coat pockets, pulled out lorgnettes and eyeglasses and put them on the table. "So, glasses-put on nose, see! These are my eyes, nice-a eyes!" Saying this, he brought forth more and more eyeglasses from his pockets until the whole table began to gleam and sparkle. Myriad eyes peered and blinked and stared up at Nathanael, who could not look away from the table, while Coppola continued putting down more and more eyeglasses; and flaming glances crisscrossed each other ever more wildly and shot their blood-red rays into Nathanael's breast.[5]

The spyglasses and the binoculars turn out to be only seemingly less demonic. The latter are finally bought by Nathanael and it is through that particular instrument that he sees Olympia, daughter of professor Spallanzani, for the first time. He immediately falls in love with her. His aided vision seems to bring him closer to her

and allows him to fully control the situation. However, it also blocks him from noticing what everyone else already sees: that Olympia is an automaton. Nathanael will only acknowledge her artificial nature after seeing her motionless, mute and above all deprived of her eyes, which Coppelius-Coppola will take from her after a row with professor Spallanzani. We can identify a number of optical themes in the narrative (the eponymous Sandman is a mythical character who puts children to sleep by sprinkling sand in their eyes; in Hoffman's depiction, Coppelius-Coppola plays the Sandman role), but one of them seems especially important: as the story progresses, the concept of "seeing" gradually loses its original meaning. It becomes apparent that the naked eye is fallible and susceptible to illusion: in early 19$^{th}$ century, scientists had difficulty distinguishing true science from charlatanry – after all, that's one way of reading the history of research conducted by the likes of Jan and Jędrzej Śniadecki, Lavoisier or Humphry Davy, to name just a few of the better-known scientists of the era. And it's not a matter of anachronism or the question itself, which is naive from a contemporary perspective. (Today we consider investigations into animal magnetism or the essence of life, whether it and an electrical spark are one and the same, fringe science.) Rather, it's about feelings of powerlessness and the uselessness of one's cognitive tool-set against reality; as feared by Jędrzej Śniadecki-science can only become a spectacle and a "romance of experience."

However, gaze aided by numerous optical augmentations turned out to be no less naive and powerless than the naked eye. The augmentations may have been considered dangerous and demonic at times because, as Hoffman illustrates so well, they were capable of creating images of their own volition. That perception did not apply solely to optical devices used "overtly" for that particular purpose – photographic cameras (which, in 1817, were still in their infancy) or a wide range of "illusion-making machines." Even the "blameless" lens, supposedly objectivizing and correcting our gaze, whose sole purpose was to magnify and sharpen (as in glasses, spyglasses, or binoculars) eventually revealed their uncontrollable nature, created their own images and gazed basically without human involvement. The expanding array of available optical instruments promised twofold benefits. Firstly, a sharpened vision which made visible what was once hidden from view, whether by reason of too great a distance (heavenly bodies) or too small a size (the microbe world).; secondly bringing out of what was once invisible–forces and phenomena of

nature, experienced but not perceived visually, like electricity or vacuum. Was the terror of illusion not a part of that flawless, sharper image obtained through the use of a combination of lenses? Was it perhaps not an image at all but a projection – not sharpened reality but augmented illusion?

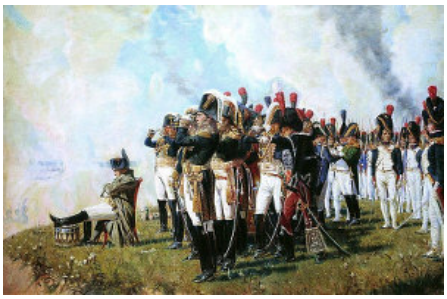
## Illusions of the Armed Vision

Vasily Vereshchagin, *Napoleon near Borodino*, 1897

The phrase "to gaze with the aided eye" has at least two different meanings. All optics-based research instruments, used for magnification and visualization purposes, provide an armor for vision in a metaphorical sense. Polish uses the adjective "armed" to describe eyes augmented by optical instruments, and this particular linguistic approach was often realized quite literally: in 19$^{th}$ century iconography, leaders and conquerors were usually portrayed using telescopes or spyglasses. James Cook wields one in his portrait painted by John Weber (1776) and so does Field Marshal Kutuzov in Piotr Basin's portrait (1833-1834). Thomas Lawrence's original portrait of the Duke of Wellington (1824) features the subject holding a watch; only on the Duke's express wish was it replaced with a spyglass and it remained there in all subsequent versions of the painting (like in William A. Menzies' 1910 reproduction), to stand in for military decorations and function as the sole, discretely martial attribute indicating he is the victor at Waterloo; Wellington is not wearing a uniform but a black cloak, only the optical instrument he wields asserts that this is no romantic explorer-traveler but a professional soldier and a general of an empire. In Horace Vernet's 1836 portrait, Napoleon uses a spyglass to inspect the battlefield before the Battle of Wagram - the gesture of a man secure in the belief that he will win.

Vasily Vereshchagin's *Napoleon near Borodino* (1897) seems especially interesting in this particular context. Napoleon can be seen sitting with his head bowed, one leg propped on a drum, its spirit-rousing thump silenced. In the foreground is a group of French generals, packed closely together in a tight knot. All of them follow the battle through innumerable field glasses. Each one through his own lens, as if

hoping that one of them will finally conjure up the expected narrative, the projected victory. The truth, however, is not revealed to the aided but to the inner eye; if anyone has any sense of the impending truth, it's Napoleon: resigned, dispirited by the looming ultimate failure of his Russian Campaign; he sees more than just the outcome of a single battle.



Sir Thomas Lawrence, *Duke of Wellington*, 1824

In a way it feels similar to a passage from Mickewicz's *Ordon's Redoubt*: "a young eye is better than any lens," says the General to the Adjutant while putting away his spyglass. "Do you know Ordon, can you see him yet?" he asks and the Adjutant's retort is dynamic and filled with detail. "I can't-but I will find him-see him!" Despite the tears and the smoke and despite his "vision getting darker" he notices a hand clearly giving orders, a lightning-quick arm, swinging to-and-fro, threatening, "holding a flare." The Adjutant is also witness to Ordon's legendary jump. It's hard to think of the passage as just a naive lecture on the young Adjutant's visual acuity. In its last moments, the redoubt is shrouded in smoke, obscuring a clear view of the figures and offering only tussling shadows instead. Only the inner eye has a clear view of the course of the events, whereas the lens, even in the hands of a mighty General, will only fail and deceive its wielder. Therefore, observation (a task undertaken by both the General and the officers portrayed by Vereshchagin) becomes something completely different from testimony (represented here by the Adjutant).

These systems - the system of observation and the system of testimony, tightly intertwined back in the Romantic-era attempts to integrate all experience – seem to drift further away the closer we get to the close of the 19$^{th}$ century. It would be difficult to prove the failure of the armed vision and the triumph of the Romantic belief in the essentiality of inner truth. The 19$^{th}$ century saw the decisive rise of the importance of gaze augmented cognitively (instructions, explanations, knowledge of nature) and technologically (professional instruments: magnifying glasses and microscopes), a gaze with perfect vision, protected by a pane of hardened glass and ready for further conquests.

An anatomical model of the eye and an accompanying explanation of the mechanism of human vision was presented at the 1913 Warsaw Technical

Exhibition: the attendees could see how light is focused and reversed by the lens. A reporter wrote of the display:

> One exhibition uses wax and papier-mâché models in order to detail a variety of light-induced burns: from sunburns through X-ray burns, up to first-, second-, and third-degree burns.[6]

The same exhibition also featured photographs of droplets of water seen through a microscope. Journalists attending the Hygienic Exhibition (Warsaw, 1897), indicated in their reports:

> There are invisible enemies whom we all should confront with a full frontal assault; but battle requires preparation, therefore we should do our utmost to learn everything we can about our foe. For this exact purpose, Doctors Bujwid and Elzenberg have opened their bacteriological laboratories to the public and each day, at set hours, lecture tightly packed visitors on the life of these tiny, invisible beings that invade our organs. [...]
> Meanwhile, all interested visitors of the exhibition can see a range of bacteria responsible for ailments like carbuncles or fowl cholera, either in different stages of development or post-treatment. The exhibition also features anatomical models supposed to portray human organs afflicted by various diseases [...]
> The forgeries section features candy colored with toxic and non-toxic materials. A single look at the two is enough to never ever be fooled again.[7]

A lot of similar reports can be found in newspapers from that period. Transparency brings into view that which was heretofore invisible and the existence of which could have been doubted. The invention of microscope predates it, but the discovery that some bacteria may actually cause diseases happened only in the late 19$^{th}$ century. Thus, the world of these "invisible enemies" was revealed and made observable. During the 1913 Warsaw Technical Exhibition, "a professional ophthalmologist would examine all interested attendees"; the intention of the organizers was to extend an invitation to blue-collar visitors (although I don't really know whether they actually attended events like this) and encourage them to examine their vision. Within the context of the entire report, however, that particular passage creates another image: the newly repaired and educated gaze would allow one to distinguish

between toxic and beneficial foodstuffs, while the display of burned and seared skin would communicate the mechanism behind injury and disease. All of that was to give us hope that forces of nature, heretofore beyond our control, were to be finally subordinated to gaze and its tremendous power.

The main protagonist of one of Bolesław Prus's novellas, published seven decades after Hoffman's *Sandman*, is a reporter at a Warsaw newspaper. Tasked by his superiors, he journeys to France in 1889 to see the eponymous *Tower of Paris*,even though it had not yet been finished. After locating it in some unexplained way, at its top he finds the main architect and a handful of sentries standing guard, the former *armed* with a mighty spyglass through which he can see "not only the entire globe, but everything that has happened and will happen on its surface."[8] Observation of the most proximate reality–that is the construction site of the exposition–yields fairly bleak conclusions:

> the edifice constructed by the French was gleaming with beauty; the German pavilion emanated strength, whereas the Polish structure started falling apart right after construction work commenced. The builders lost their will to work and bad-mouthed the directors, while the directors, seeing that they have no chance of getting anywhere with the construction crews, banded together and went on a trip around Europe [...].[9]

When the spyglass is turned towards Warsaw, the images it captures are simply lamentable: it sees a husband trying to restore his wife to health by immersing her in a clay pit pond – in the midst of winter – because he was persuaded to do so by a medicine woman. "To hell with that spyglass of yours [...] It only shows things obtuse and vile." "What a worthless thing, your spyglass."

A record of a very similar experience (although it had been the intention of the author to write a meticulous account of his journey and not a work of fiction) can be found in passages of a book written by Michał Kłos about his visit at the 1889 Paris Exposition. From the third platform of the Eiffel Tower:

> [...] Paris looks completely different. The capital appears as if it were made of cardboard, its surface bulging upwards to reflect the sloping cityscape. From this height, the beating heart of the country rather resembles a land of the dead, nothing seems to move as we look upon a barren sprawl of

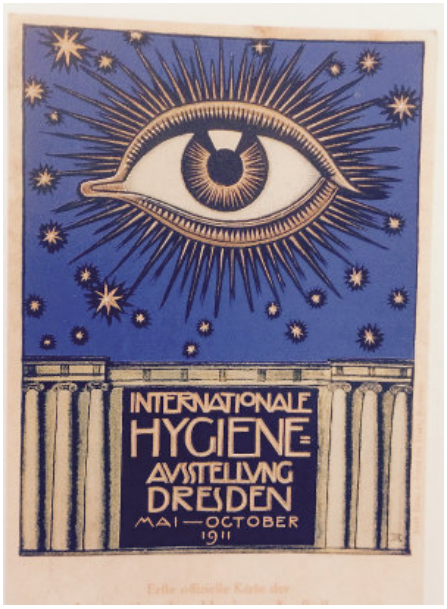
> stone. It's too magnificent a view. And above us, only the unceasing expanse of the sky.[10]

Kłos's account is sweeping and the author uses the category of "marvelousness" eagerly and often. It seems to me, however, that this passage is an outstanding explanation of what it means to "see with modern eyes": to gaze over all from up high, to see as if reality is nothing more than a mock-up. We expect reality to imitate itself, to "stage" itself like a play- to reveal itself, present itself in its most pure, model form.

We don't know what to believe: looking with the aided eye presumes that one can be fooled by illusions created by the instruments aiding our vision, illusions which are often unwanted and in some way repulsive (as if reality magnified was always inhabited by pathogenic microorganisms), whereas the unaided eye is imperfect. Ever since the beginning of the century, we have been dealing with a framework that considers experience (in both meanings of the word in Polish: professional research/experiments and the colloquial meaning-sensual experience, everyday experience) and observation thereof is deceptive. Moreover, the sense of this illusion, this fraud, may be intuitive, may be the *impression* of fraud, as we lack the appropriate cognitive tools. Not much has changed in this particular regard - the further we go into the century, the less certitude can be drawn from experience and the more questionable the result of the observation. This applies to more than just photography, the apparatus employed to produce ghosts on stage, the cinematograph or its predecessors, and the fact that we are able now to depict and observe events that never happened and people who never existed. Even the most basic experience of the motion and stillness of one's own body was disrupted over the course of the 19$^{th}$ century. Observing a moving train from the window of a train standing still introduces precisely that sort of confusion- we don't know what is moving and what is still and what the reference point is. Maybe the reference point is the objects on the ground - like trees and structures - but then again, isn't the Earth revolving around its axis? Ultimately, we cannot know whether the landscape is moving or we are. Ever since it became possible to watch the outside world through the window of a train car, that which moves and that which is mobile has become a system of interrelated relativities rather than just movement juxtaposed with stable points of orientation.

## The overabundance of transparency and superfluity of gaze

Is the intensity of 19th century exhibition practice in any way related to the mysteries of vision? The transparent walls of the Crystal Palace (and its innumerable offspring) may have appeared to be some sort of salvation: the object of the gaze is defined and immobilized; it is *exposed* but not subject to the gaze of either the naive or the aided eye. The glass panes of store displays, train car windows enabling travelers to experience the landscape and contemplate views framed by the glass, glass closets and museum displays which reduce the sensual aspect of our experience, suppressing hearing, touch, taste, and smell. Smelling, touching, or hearing the showpieces will be included in the roster of practices and behaviors allowed at exhibitions only in the 21st century. On the other hand -glass covering an exposition does not serve as an instrument of observation: it seems exempt from all suspicion; it neither magnifies nor reduces and does not produce projections.




Franz von Stuck's 1911 poster for the Dresden Hygiene Exhibition. Reproduced after: Paweł Banaś, *Orbis pictus. Świat dawnej karty pocztowej*, (Wrocław: Wydawnictwo Uniwersytetu Wrocławskiego, 2005), 193

However, the structured reality of the exhibition becomes something impossible to digest to the naked eye. The transparency of exhibition palaces promises much, but is ultimately revealed to be suffused with melancholy – bewildering, and tiresome:

> Seeing all these sections ultimately renders one indifferent. Those taking a fancy to some newly discovered composer will stop here and there, look at a painting, an autograph, at the famous singers whose portraits have been put up. [...] We leave the exhibition sad and tired, feeling as if we have just left a cemetery for the famous after gawking at celebrity headstones for the past couple of hours.[11]

The above is an oft repeated sentiment. Exhibitions - in the eyes of visitors and

critics alike – too often disappoint. Visitor dismay can be expressed in a multitude of ways: there were too many or not enough showpieces; the contents of the catalogue did not reflect the corresponding reality; the descriptions and explanations were too detailed or were lacking entirely; the public is left to its own devices and wanders through the exhibition, bewildered by the plethora of descriptions. Something greater was supposed to happen, the mind was supposed to grasp the entire world (after all, major exhibitions were eager to use labels like "general," "of all nations," "universelle") but nothing of the sort actually took place. The gaze, although offered as perfect vision, glides over the transparent panes, always taking something in, getting caught up in something. It's incapable of asserting its authority over other senses: the sounds, the smells, the textures, the contact with the crowds, the airless atmosphere and the presence of other bodies are unbearable and impossible to nullify.

What is absolute transparency, then, if we know that what we see through "glasses", – as Hoffman's Coppelius-Coppola calls them – is just an image concocted by these transparent surfaces? This falls within the scope of categories like projection, mirage, illusion, maybe reflection; what we see on the other side of the Crystal Palace walls is not what is really there but an image thereof. But it is that exact image, projected by the transparent panes of the palace, that becomes the source of experience. It is what we yearn to see, although the testimony of other senses (touch or hearing), may stand in complete contradiction to this projection-reality. Before the era of crystal surfaces, exhibition palaces, and grand displays, humanity has never experienced such transparency and materialized, tangible "immateriality." So, I would consider the exhibition palace a symbol of the supremacy of vision over other senses. However, this supremacy always ends in failure, whereas transparency turns out to be a project that never existed in the first place.

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## Footnotes

1 "Panorama paryska," *Kurier Warszawski* [The Warsaw Courier] 2 (1890): 3.

2 The Architekture of Failure, (Winchester–Washington: Zero Books, 2012), chapters *Iron and Glass* and *The Crystal Palace at Hyde Park*.

3 Aleksander Chodkiewicz, *Rozprawa o ciężarze światła*, (Wilno: druk J. Zawadzkiego, 1837), 1.

4 Aleksander Chodkiewicz, *Chemiia*, vol. 1, (Warszawa: druk J. Węckiego, 1816), 41.

5 Hoffmann, E. T. A., Leonard J. Kent, Elizabeth C. Knight, and Jacob Landau, *Tales of E.T.A. Hoffmann* (Chicago: University of Chicago Press, 1972), 112.

6 W., "Światło, ruch, ciepło," *Kurier Warszawski*, October 31, 1913, 3–4.

7 W.M., "Wystawa higieniczna," *Kronika Rodzinna* 13 (1887): 385–390.

8 Bolesław Prus, "Wieża paryska," [The Tower of Paris] *Kurier Warszawski* 59 (1887): 1.

9 Ibid., 3.

10 Michał Kłos, *Szkice z wystawy paryskiej* [Sketches from the Paris Exposition] (Rzeszów: Drukarnia J. A. Pelara, 1890), 9.

11 Dr. H. M., "Wystawa muzyczno-teatralna w Wiedniu," ["The Music and Theater Exhibition in Vienna"] *Głos* 23 (1892): 269–271, 27 (1892): 317–318.