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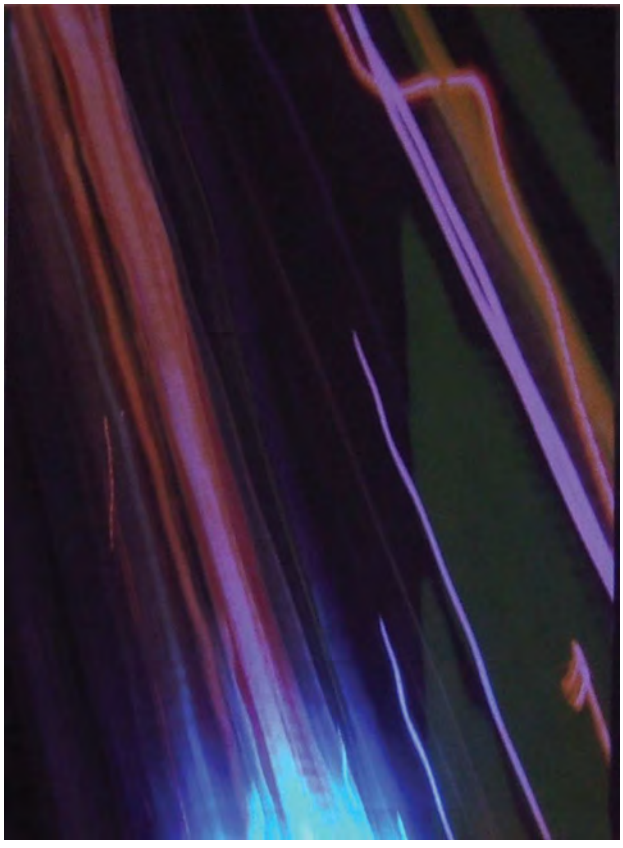
The Leonardian Dream : Tempting Completeness by a Special Interweaving of Art and Science

Attila Csáji

Within the Hungarian-Indian cultural cooperation, a series of exhibitions were realized in the recent past, at the network of the National Gallery of Modern Arts, in Bangalore, Delhi and Mumbai, which wore the following title: 'From Organic Forms to Light Art' (a selection of contemporary Hungarian art). Organic forms imply the nature and the need of integrity; 'light art' as a definition is unusual, it stops you and makes you think. Light is the basic cause of visibility – at the fine arts it is indispensable. It is an integral part of everyday life, but something else also resides within it. It is one of the greatest human experiences – it radiates devotion or even adoration, purification and ascension. It is a research subject for scientists and it can create an elevating sacral experience at the same time. But does the light not only make the objects visible but also create art in a direct way ? The light experiences of nature suggest such since ancient times.



LászlóMoholy Nagy – one of the determining masters of the Bauhaus school, which had a serious impact on the art of the 20th century (Weimar, Dessau) – announced with prophetic enthusiasm in the 1920-30s that most of the future works of art will be the task of light-painters. Following his footsteps another Hungarian artist, György Kepes, who was the head of the light department in the New Bauhaus in Chicago, created the first research institute, the Center for Advanced Visual Studies, at the Massachusetts Institute of Technology, in Cambridge, in 1967, in which artists, scientists and technologists could work together on new medial researches. The institute has become exemplary in the world since then. The idea of László Moholy Nagy sprouted, but it was the opto-electronic revolution that meant the most serious impulse, that has been rewriting also our daily lives in the past decades. This system of tools (the laser, the computers, the holography, etc.) compares with the tools of the time of Moholy Nagy as a magnifying glass to an electron microscope. The artistic utilization and humanization of the system of tools created by the modern science and technology is one of the prominent tasks of the contemporary art.

The International Kepes Society regards this as a primary mission – 14 members of the society, of course the Hungarians, took part in the exhibition series in India. (Éva Bortnyik and Csaba Tubák: light installations; Zoltán Bohus: glass art; Attila Csáji: pictorial possibilities of laser, superposition method, holography; László Haris: conceptual photo; Attila Kovács: geometric structures; Klára Kuchta: UV-sensitive textiles; Ferenc Lantos: geometric painting, analyzing nature, structure building; Ilona Lovas: light installation; Mária Lugossy: glass art; Waldemar Mattis-Teutsch: pixel holography; András Mengyán: surprising dimensional effects created by UV-sensitive paint; anamorphias of István Orosz; plexiglas sculpting of László Paizs.) Our presented artworks are mainly based on the utilization of the contemporary scientific and technical possibilities; they represent one of the dominant threads of the artworks exhibited in the NGMA in Bangalore.

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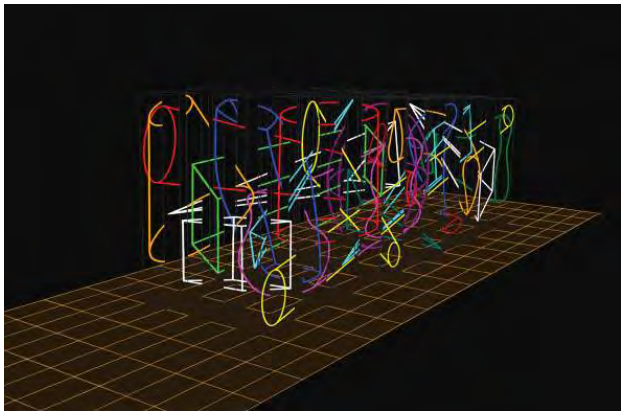
This is the objective side of the background story of the exhibition. There is also a subjective one, which is connected to the curator of the exhibition. In my work organic and light art meets each other, which provides a conceptual basis to the exhibition series realized in the NGMA. Through this, I can present in the strongest way the activity in which art-science-technology are intertwined, and which appeared at the exhibition of the NGMA very markedly. This activity attracted international attention, and I was invited by the Massachusetts Institute of Technology / Center for Advanced Visual Studies on this basis to be a member of the institute. But this only occurred in the second half of the '80s. The path leading to this began decades earlier.



I have been interested in forming images using light since the middle of the sixties. My works titled 'Messages – Sign Grids' - these plastic structures evoking ancient writings and that can be further interpreted by oblique light (also known as side light orindirect light) were the precursors of my light art works – one of which could also be seen in this exhibition series. From the early seventies, I started to use special paints in some of my works. I could further interpret my pictures painted with luminescent powders sensitive to the different wavelengths of electromagnetic radiation (e.g., to 330 or 380 nanometers UV light) with the appropriate light sources. Thus I, in a manner of speaking, mobilized the pictures. I created neon statues in the middle of the seventies. The major change occurred in 1977. Norbert Kroó, Physicist, leader of the laser research in Hungary, attending my exhibition organized in the Hungarian National Gallery, saw how much I am interested in the further development of pictures by light. He invited me to the laboratories of the Central Institute of Physics (Budapest), so that I could continue my experiments by a well-maneuverable light source, the laser. I came into intimate contact with the modern optics here. With Norbert Kroó, we established a research group in the Institute, the 'PHOTON ART', which was responsible for the exploration of the pictorial possibilities of the laser light.

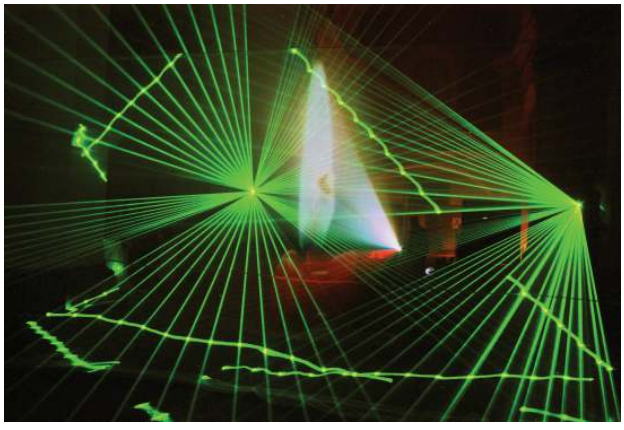
As the leader of the group, I specified the basic objective - the characteristics of the laser light from the painter's point of view. It is may be more accurate if I say that these should be approached from the viewpoint of an artist working with the visual possibilities. While, for instance, discovering the characteristics of the marble has a thousand years of living experience and a lot of things can be taken over from the masters, the laser light was almost a virgin area for an artist in the seventies.

The three basic characteristics of the laser light are the following :

1. The high degree of maneuverability;
2. The high brightness concentrated to one point;
3. The high degree orderliness and monochromatic nature of the laser light, and its interference ability resulting from this.

These involve different pictorial possibilities. Let's take these characteristics of light one by one. From the concentrability to a single point came the drawing by

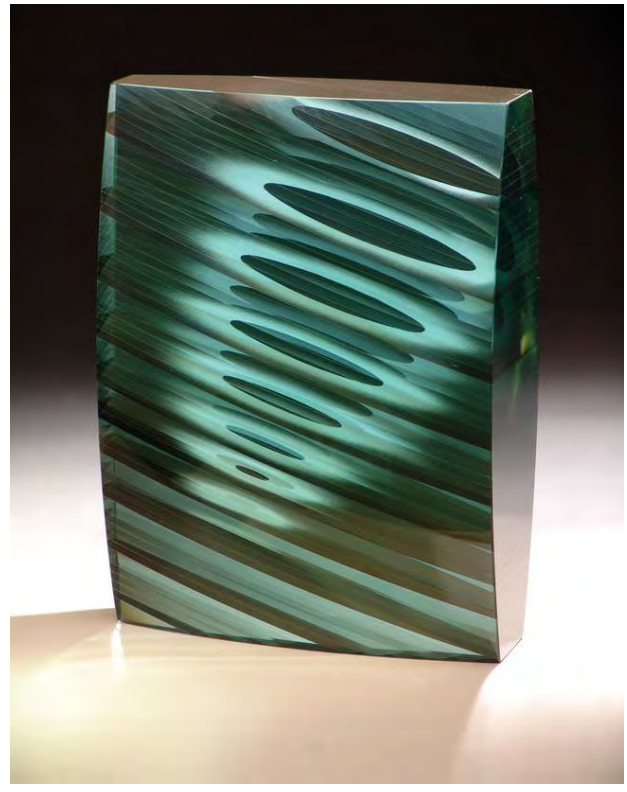
scanner, which can be realized with the help of swinging mirrors moving on the x and y axes, controlled by electronics and computer. In the United States, besides holography, they concentrated mainly on this, and reached excellent results. For this, swinging mirrors with special frequency, eliminating post movements, were necessary – but at the end of the seventies, these were on the so-called 'COCOM' list – thus in the so-called socialist countries they were unattainable. This also contributed to the fact that in our researches we concentrated on the third light characteristic of the laser, the monochromaticness. At the end of the seventies they regarded interferences as a physical phenomenon, which is not moldable by the artist and is not manipulable.



At the start of the analyses I regarded my primary task is to reveal the pictorial chaos of the meeting of the light waves which appeared random, to establish order, to find the most usable motifs and the tools and correlation of conscious manipulation. At the beginning, we developed hundreds of photos necessary for the analyses – marking the diameter of the laser light used, illumination, transparent, plastical surface and the generated interference light shape. One of the first things learnt was that the generated light shapes have no depth of focus, thus it can be captured on different geometric surfaces, light environment can be created and it can even be projected on the human body.

The second: as a consequence of the analyses, I could slowly come to regard the surface forms as codes, that, when displayed by laser light create given interference characters.

The third led – indirectly – to the furthest. The forms are realized in a so-called Fourier cone. The apex of the cone is on the illuminated crystal clear transparent disc, and moving away from this – defined by the aperture of the cone – the resulting light shape gets bigger and bigger. I tried to manipulate this with different optical devices.



During the experiments such possibilities for further interpreting the view arose before me, which made the realization of a new image alteration method – the so-called superposition transformation mode – possible (International Patent 1980). The essence of the method is the flexibility of optical devices placed at the appropriate location on the optical car compared to the media disc (patent), and that it is based on interferences. The novelty of the view is realized by the superpositions and for its display coherent light is indispensable. The motif recorded on the so-called image-disc can be further interpreted with classical optical devices inserted at the appropriate place. In the resulting picture are the modeled real micro-motif (mask, human head, braided ribbon, etc.) and its Fourier transform and the related multitude of interference pictures can all be observed.

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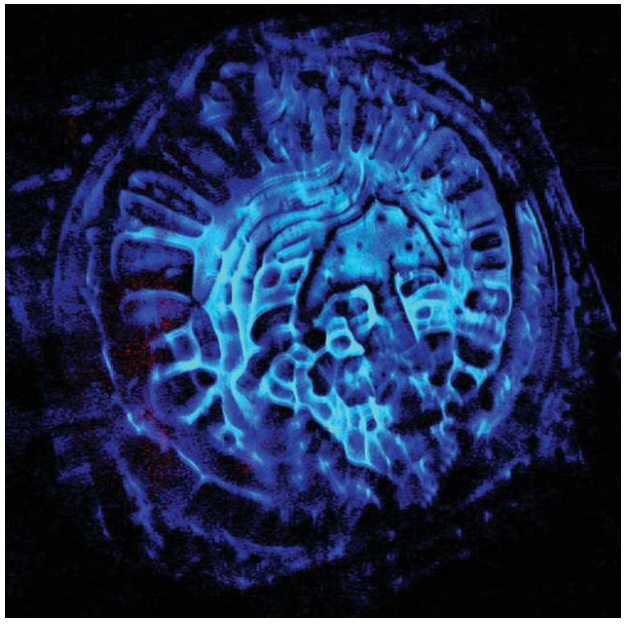
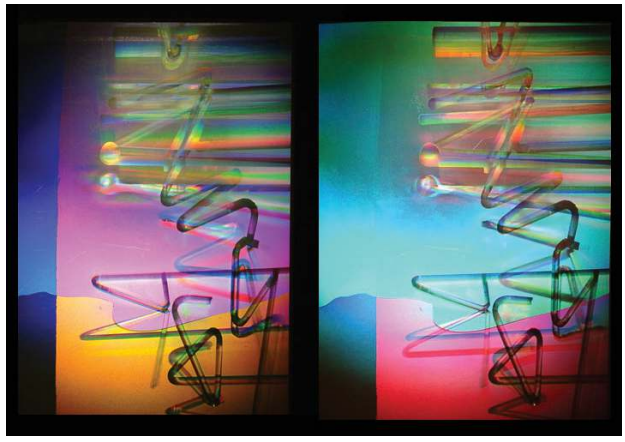


Their proportion in the metamorphic development of the process is variable. The largest opportunity in this method is the possibility of making visible the connecting bridge between expressivity and regularity. The organic and continuous pictorial changes create the transitions between the world observable with our eyes without auxiliary aids and the mathematically, precisely describable laser interferences. This process brought an unparalleled richness of the forms that can be created only by laser. (English language informative article: Leonardo 1992/1.) Inherent to the visual thinking in this method is concentrating on the metamorphic processes, the timeliness resulting from this, creating environment by light, multimedia, and acquiring such knowledge that have interdisciplinary nature. Also at the MIT, which is perhaps the most important global center of the medial research, this method was regarded as unique, and Paul Earls introduced me as a breaker of virgin lands. My laser animation film presented at the Bangalore exhibition, the '6th or the 7th' (Budapest, Pannonia Film Studio, 1982-83) is built on this superposition method.

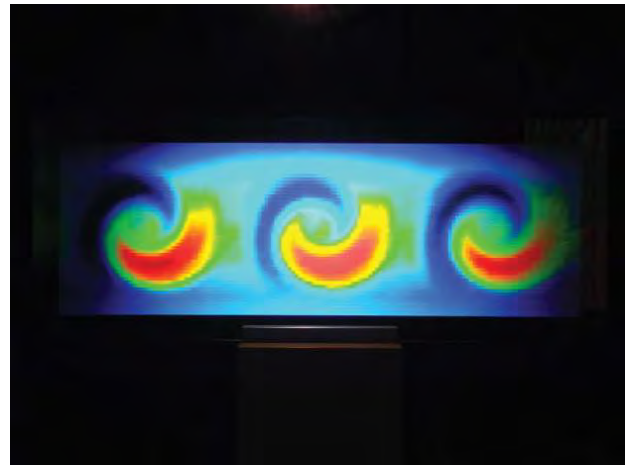
The making of the film was also a groundbreaking undertaking. It was presented at several places: in the Hungarian National Gallery, in the German Film Museum in Frankfurt am Main – on the occasion of the first holographic World Exhibition, where holography was introduced as a new artistic media; at the Museum of Modern Arts in Paris, on the occasion of the exhibition titled ELEKTRA, where those artists were presented who can be classified as innovators of the artistic use of electricity; at the Massachusetts Institute of Technology in Cambridge; at the Oberhausen Film Festival, in London, in New York, etc. In India it was an integral part of the exhibition titled 'From Organic Forms to Light Art' – and during the exhibition it was projected continuously. Dynamic metamorphosis is the defining experience of forms of the film. At the same time it is a visual paradox, which creates strange correspondences between the microcosm and macrocosm: cells are formed from the star clusters, and infinite space from crystals. The instruments which are unavoidable in our civilization become the servers of the artist's thinking, and create a world which is continuously expanding in vision as well as around us. In the film the superposition method becomes the source of new sensory experience and harmony.

From the coherence of laser light derives its *holographic* use, as well. The first hologram was created by Denise Gabor Hungarian physicist even before the invention of the lasers. The lasers provided significant opportunity for the holography, as well. Holography today has several types: reflection holograms, transmission holograms, multiplex holograms, shadow grams, rainbow holograms, etc. In the exhibition you could find the transmission hologram, the reflection hologram, the pixel hologram and a special variety of the rainbow hologram. Within holography I was primarily interested in what are those pictorial opportunities which are only made possible by the instruments of holography, which only exist virtually,



but can be made reality through holograms. Such as the levitation of mass, the transparency of masses, questioning the evidences of spatial perception, creating color changing structures within the picture, etc. – with which the perceivable-visible world can be further created. Of the artworks displayed in the NGMA the light calligraphies (transmission hologram) – whose inner color structures are mobilized by the movements of the viewer – belong to this. These holograms are part of a series and relate to the Sign Grids created in the sixties that are also calligraphic. Here I was primarily interested in the plastical structures which, could be shaped by side light, in a monochrome world of colors – but here colors became strong, heightened and I was more interested in a liberated, mobilized, but still harmonized color scheme rather than plasticity. In the case of my hologram titled 'Light Source' color permutation appears, with the changing of the colors of the pictorial information arranged in rows (blue-violet, orange, etc. dominance – in an associative aspect with the change of the lights-colors the night-day, etc.). Its essential content, however, is deeper. I was asked to create this hologram for the 100th anniversary of the Budapest Museum of Fine Arts – thus it is primarily an 'honor to the guardians, the guardians of inner light'. Its essence is the beyond-avant-garde formulation of a classical idea. The Museum for me is not dead, I regard it as a source of light, which is an accumulation of inner light – and it radiates this fertilizing light to those who are receptive for it. The title of the hologram, the 'Light Source' also derives from this.

The large pixel hologram of Waldemár Mattis Teutsch, the 'Maeltstrom' belongs to the category of the so-called pixel holograms. The beginning of these is created on computer. It has no depth of field – but it still occurs from the spatial indicator role of the colors, as blue is located in another segment than, let's say, the yellow or the orange. Its visual default value is built on this. The creator establishes a formally defined, starting color structure (wave crest vortex), which affixes on a holographic emulsion layer, and by the change of position of the viewer, it effects a change in the color structure in the order of the colors of the rainbow. It is highly decorative and its size can be increased substantially – thus it is suitable for holographic covering of even walls of buildings. It is one of the most impressive pieces of the exhibition – this is why I



consistently placed it in a way to influence the basic experience of the entering person.

The other determining spectacle of the light art section of the 'From Organic Forms to Light Art' exhibition is derived from the *phenomenon of luminescence,* the use of *paints sensitive to ultraviolet light.* The large size textile of Klára Kuchta that can be hanged on the wall and the pictures of András Mengyán belong here.

In the exhibition four paintings of András Mengyán, created with paints sensitive to ultraviolet, light can be seen. They are strongly reductive, restrained, rational pictures. They belong to the constructivist line which has extraordinarily strong traditions in Hungary since Lajos Kassák and László Moholy Nagy, and to which the sensitive geometric line rhythms of Tamás Konok, the system building geometry of Attila Kovács and the works of the excellent teacher, Ferenc Lantos also belong. Mengyán just partly belongs here; he overgrows this tradition, and creates an unmistakable individual path.

What does this individual way consist of ? It is mainly of the electroluminescence, the differentiated and resourceful use of the phenomenon of photoluminescence and its characteristic geometric structures. One of his typical methods is replacing, sequence changing. His systematic nature, the consistency of his thinking, the in-depth analysis which is his essential feature are all taking him towards thinking in pictorial processes. This way of thinking implies the need to break through the closed structures, a more complex world view, which carries within itself

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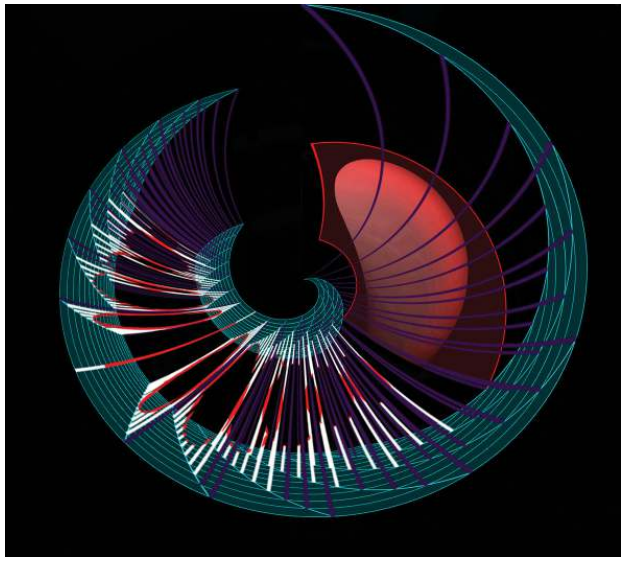
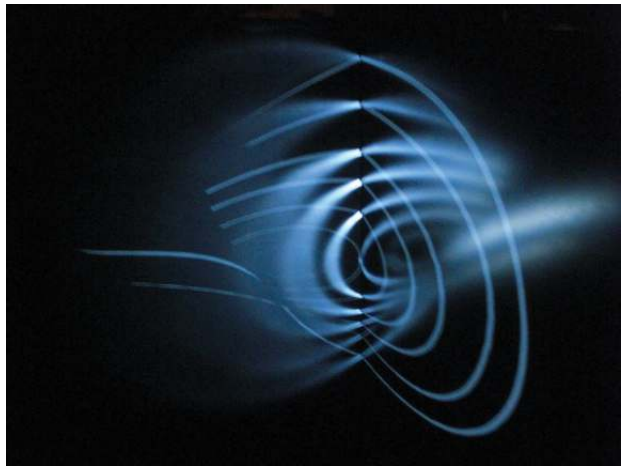


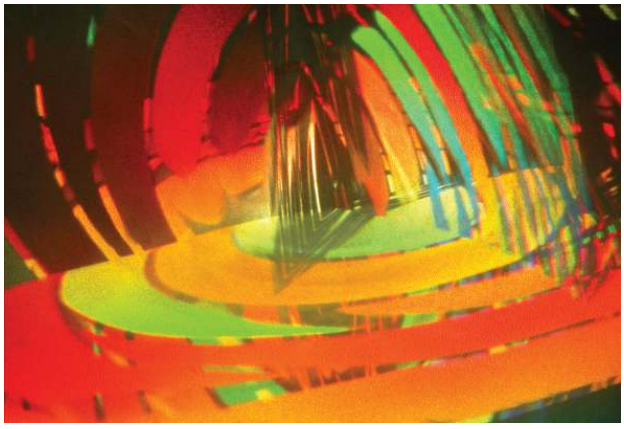
simultaneity – synchronism – and the possibility of development of forms within the time processes. It recognizes that depending on the light conditions, the interpretation of the pictures can be different. The plane is divided differently by the lines, curves and shapes created by the specially activated paint sensitive to photoluminescence, than by the ones made with common pigment paint. Spaces, symmetries and dimensions with a character that is different from the known geometric structures can be created by them. With the aid of the so-called 'black light' at places its colors become aggressive and vivid, often they appear from a black background – this way also enhancing the assertion of the luminescence. As we know, luminescence is the light emission accompanying the spontaneous return of the electrons from their excited state to their base state. These luminescent colors have different saturation and sensible intensity than of the colors before the excited state. We can experience with the pictures of András Mengyán that the different combinations of the 'lucenera', the black light and the UV active materials in the consciously developed structures can create magical light effects. All this he creates with impressive intensity and consistency. The life work of András Mengyán is an outstanding achievement even measured on the standard of international light art.

The third unit of the light art section consists of the light installations. In the case of an installation, the visual experience usually derives from the interaction of the devices used – the interaction of the medium (here: video) used and the object – set of objects – on which the projection happens. In the case of the artist duo Éva Bortnyik and Csaba Tubák (husband and wife) it is a V shaped object painted black, with dull light. The planeness of the projected surface disappears by the V shape. The world of forms evoking Op Art is projected on them. The metamorphic changes of geometric forms shaping with orderly, but still liberated playfulness consciously enhance the spatial experience. This is also further increased by the particular quality and slight reflectiveness of the special black paint used.



In case of the installation of Ilona Lovas, we can see a double video image projected next to each other. It is a special memorial to her master hat-maker grandfather. On huge surfaces touching each other water is fluctuating silently – radiating the calmness of infinity –, hat shapes made of wood are swimming-floating on them.

In the work of Zoltán Bohus, the interconnection between the knowledge of light art, industrial technologies and the constructivist way of thinking occurs. It was an excellent idea to put his work on the invitation card of the exhibition in Bangalore. He is one of the outstanding personalities of the international glass art. He is the groundbreaker of the glued-layered glass, the so-called cold processing. With him the transparent-translucent material and the symbolic interpretation of light are in harmony with the strict adherence to the optical laws. He is constructivist and lyric at the same time. In his works, in the relation of the glass and the light, resides the connection of time and infinity.

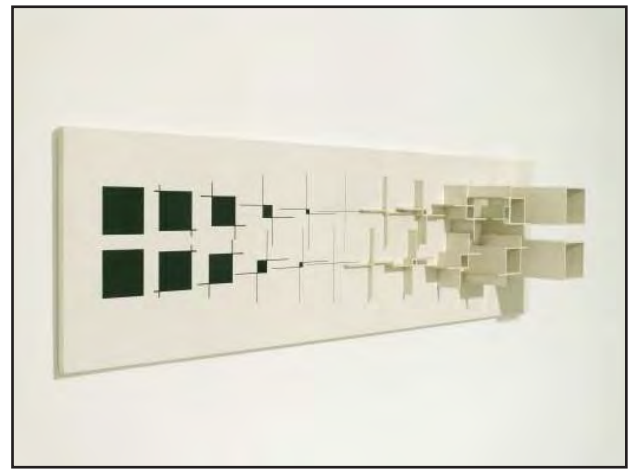


In his works, Ferenc Lantos repeatedly highlights the mathematical laws recognized in organic forms (e.g., the Fibonacci series or the golden ratio). He developed an excellent visual education system, which builds on the discovery, exploration and creative familiarization with the autonomous visual language.

Attila Kovács has been dealing for decades with the drafting of a new non-figurative synthetic visual language, one that can be programmed with the informational logic of yes and no. The aim of his art is changing the given visual qualities into different visual qualities. His starting point is the non-Euclidean mathematics of János Bólyai and the visual aesthetic information theory of Max Bense.

Tamás Konok is the third geometric painter who partakes in the exhibition. In his case, I quote from the author himself : 'My line structures are the harmonies of my thinking process. It is an interconnecting system, which refers to the infinity beyond the picture. In the past thirty years, I have been ever more drawn to the transcendent feeling of life, which exists regardless of experience, for the presentation of the timelessness, which cannot be comprehended by the mind.'

The anamorphic engravings of István Orosz evoke the classical craftsmanship knowledge of the book illustrations of the 19th century with their lean-linear elaborateness. He associates all this with bizarre geometric transformations. Surprise and humor are also not far from his graphics, which can be interpreted with magical mirrors. Let us think, for example, of his work titled 'Albert and I', which was presented in the exhibition in Bangalore, where the chaotic world of the environment resolves into the head of Einstein in the cylindrical mirror, but if we take away the mirror, the face of the creator, István Orosz, is smiling at us.



László Paizs creates a crystal clear, translucent encompassing form from a typically contemporary material, and lifts the object within it to a different dimension. He hands over the transient pieces of the present – for example, a mousetrap, a coca cola can, the headline of a daily newspaper – to the infinity, encased in crystal clear Plexiglas. He preserves the insignificant, and thus elevates it to a different category. He begins his Plexiglas works at the end of the sixties. He notes even at that time: 'with these objects, I wanted to create conscious fossils'. Artifacts saving from the present - A grotesque mirror to our everyday life.

The title of the conceptual photo of László Haris is a date: 5th June 1975. On the indicated day he took pictures in three-minute intervals of a suburban square from the window of an average house in Budapest. Placing this one after the other, he quasi laid time out to the plane. The photo sequence consisting of 480 pictures follows the events of a single weekday. The 24 hours time process becomes a single picture – the resulting view is a new quality visual reality.

The few thoughts that present the fertilizing interweaving of art-technology-science are mainly based on the Hungarian material displayed in the network of NGMA in Delhi, Mumbai and Bangalore. It is an introduction to the nowadays ever more complex problem of the relations of light art, science and art, and to the visual thinking akin to this. In the last

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decades, light became an independent creative medium. Its possibilities are now unfolding and spreading. Light art in many aspects also means the re-thinking of the time-space approach of the artwork.

Light art is such a territory of visuality with inner dynamics that it is not a style or trend of a closed art historical period, but it is a forward-curving combination of new medial possibilities which unfolded in the last decades. Significant catalyzing role was played by the dynamic advancement of opto-electronics for the basic human need to dip the new results of technology and science in the depths of human psyche.

We presented a section from the Hungarian contemporary art here in Bangalore in the National Gallery of Modern Arts, the art of a nation which lives in the center of Europe. The EAST appears again and again in the Hungarians legitimately, if we think of our traditions – which bring us back to the center of Asia. Once an Asian nation, which now lives in the center of Europe. It is due to our Asian past, we have so many outstanding Orientalists. My first master also lived in India, he had good relations with Rabindranath Tagore, and he was the one to invite him to Hungary, where his heart was being healed. But let us also think of the visual link connecting India and Europe, Amrita Sher Gil, who has half Indian and half Hungarian origins. We have just organized an international conference in Budapest of her art – and of the Indian-Hungarian cultural relations, and also a large-scale poster exhibition about Amrita – in consultation with the Indian Ministry of Culture. We have also presented this exhibition in the palace of the UNESCO in Paris – in cooperation. Let me mention that this building, the headquarters of the UNESCO was also designed by a Hungarian architect – Marcell Brauer. The Hungarian Academy of Arts was the main supporter and organizer of both events, and also of the Indian exhibition series, next to the Balassi Institute.

We wanted to give a flash of insight in the Hungarian contemporary art, and within this the light art on the exhibition series titled 'From Organic Forms to Light Art'. Part of this art also lives on in India in Amrita Sher Gil's painting. We show a slice from the contemporary culture of a nation that had significant achievements especially through its scientists and its art. The art of a nation that did not take part in colonization, but was famous by its fights for freedom. A nation that was yet one of the dominant powers of Europe during the middle ages, and it resisted – as a bulwark of Europe – the Ottoman conquest for centuries. It bled out then. But let us skip forward. Let's think of one of the most outstanding events in the 20th century, the revolution of 1956, when it confronted the Soviet Empire almost unarmed, and gave a first, Davidic blow to an ideology that created a terrorist state. The worldwide decay of this ideology began at that point. The bold actions are also inseparable from its art. Let's try to answer the question, from where does it originate ?

One of the basic reasons is the parallel openness to the different tendencies of the Hungarians.

Hungarian culture owes its extraordinary richness mainly to this. It turns at the same time and with almost the same intensity towards the West's – the Euro-Atlantic culture – renewing results – in relation to the exhibition, let's think here of the light art (Bortnyik, Csáji, Kuchta, Mattis Teutsch, Mengyán), of the geometric art (e.g., Konok, Kovács, Lantos), or of the sign-like gesture painting (A. Végh), and towards the East, the existence-stabilizing survival of the view of the ancient cultures – in relation to the exhibited artworks, let's think here of the artworks with an organic view, the buildings and drawings of Imre Makovecz that are almost evoking living beings, the architecture of György Csete, the sculptures of Sándor Csutoros and IstvánIlyés, the sign grid of Csáji evoking ancient writings, but I could continue the line at length.

It is my conviction that this parallel openness to the different tendencies cannot be observed with the same intensity as with the Hungarians in any other nation of Europe. The consequence of this is a spectral richness, which is almost unparalleled. We wanted to indicate this richness with this exhibition. Surreal hybrid creatures at Csíkszentmihályi, full-blooded terracotta in the Minotaur stories of Schrammel, the silence, the meditation, the sea in the works of Tenk, the style of whom is in many aspects akin to the one of Amrita Sher Gil, the super realism in the pictures of Jovián, grotesque social critique in the'boxes' of Péter Prutkay, the irony of the Plexiglas sculptures of László Paizs. Oftentimes this duality is fought within the same person, the same artist (Csáji, Orosz, Stefanovits, etc.).

From time to time those who dream the Leonardian dream again, that the art and the science are not torn apart irrevocably, re and reappear. These thoughts appear in the science and in the art, as well. Kornél Lánczos – this excellent mathematician – writes a study about this with an overwhelming, convincing power, titled 'Science as a Form of Art'. The essence of all basic intellectual activities is the human creating power. Intuition is also indispensable for science; it is not only a privilege of the artists.

The tempting of completeness manifests in this dream. The opto-electronic revolution created a particular relevance for this re-dreaming, which reshapes our daily lives, as well.

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Participated in more than 500 exhibitions, amongst them in the LichtBlicke (Frankfurt am Main, German Film Museum), ELECTRA 83 (Museum of Modern Arts, Paris), Beyond the Art (Ludwig Museum), Hungarian National Gallery in the 60-ies, and so on.
His major individual exhibitions: Kunsthalle Budapest, CAVS Gallery MIT- Cambridge, Museum of Kassa, Hungarian National Gallery, etc.
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