ACTA ACADEMIAE ARTIUM VILNENSIS 67, 2012.
THE GARDEN OF DIGITAL DELIGHS: CROSSMEDIA PRACTICES IN CONTEMPORARY ART

Research-Based Artworks in the Context of Hybrid Media

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Abstract

The principal aim of this text is to describe the historical background of the artistic category defined as "hybrid media" in the context of contemporary art and new media. I would like to show that historically there were several initiatives and groups who experimented in "hybrid" discourse without using any specific term or other words to describe their practice. I point out that the institutional distinction between the understanding of "research" in the contexts of art and science is different, because different criteria in the sense of objectivity are used. The basic distinction is the attitude towards results, since multiple ways of interpretation are common in art but unwanted in science. One can observe a steady intention from the 1960s onwards in art practice which is based on information or competency from the fields of institutional science. Artists have constantly abandoned the romantic understanding of artistic creativity, which is based on the divine individualistic act of creative explosion, and have started to collaborate with experts from other fields. Naturally this trend does not represent a complete change in contemporary art discourse, but it can be observed that this collaborative approach, combining different competencies, is now much more prevalent in art practice than ever before.

KEYWORDS: research-based art, hybrid media, “third culture”, interactive art.

The phenomenon of mixed media, multimedia and intermedia artworks is not new. We can see the development of a combination of different art media and languages in several époques of art history, most famously starting in the Baroque, and continuing in the 19th century in the form of Gesamtkunstwerk. Now “again”, artists are working and researching in a time of “trans”, “cross” and “hybrid”. This development reflects processes in the art world generally, as artists are not identifying themselves with a medium, but by conceptual area.

I would like to reflect upon the definition of the hybrid art of Ars Electronica[1], which according to its own definition is dedicated “specifically to today’s hybrid and transdisciplinary projects and approaches to media art. The primary emphasis is on the process of fusing different media and genres into new forms of artistic expression, as well as the act of transcending the boundaries between art and research, art and social/political activism, art and pop culture.”[2]

Ars Electronica’s definition, as a trend setter, is a good way to begin the topic. At this

[1] Ars Electronica is an annual festival for art, society and technology in Linz, Austria that has been taking place since 1979, see www.aec.at

[2] “Hybrid Art”. — http://www.aec.at/prix/en/kategorien/hybrid-art/

juncture I would like to point out one event of 2005 that was dedicated to hybridity entitled “Hybrid – Living in Paradox”. Since 2007 “Hybrid Art” has been one of the prize categories of the festival.

Evidently there are choices made with the expansion of the field in question, but one reason for the formulation of the theme was to find the possibility of exhibiting non-clear and multi-disciplinary projects, which were earlier shown in the category of interactive art.

The title for the conference section of the event of 2005, which was divided by the authors Gerfried Stocker and Christa Sommerer into four parts - drivers and patterns of hybridization, hybrid economies and politics, hybrid cultures and identities, and hybrid creatures and ecologies – shows the diversity of contemporary culture.

They think that “no other term provides such a consummately appropriate and comprehensive description of the highly paradoxical current state of our world, one that is characterised by interrelationships that among other things are extraordinarily contradictory, while at the same time displaying superb operative effectiveness: annulments of boundaries, mergers, fusions and crossovers resulting in new economic and political coalitions and alliances, as well as interdisciplinary collaboration in the arts and sciences; global cultural amalgamations as outgrowths of the worldwide circulation of people and products, as well as systems of signs and bodies of information; symbolic as well as physical penetration of the human body by machinery ranging from bionic prostheses and neuro-implants to cyborgs and trans-genetic chimera; sampling, collage and re-mix techniques, as well as consistent cross-compilation and re-contextualisation of the means, forms and genres of artistic expression; escalating battles to prevent contamination of the self by the other.”[3]

Here the festival organisers seem to be diagnosing the contemporary condition.

Stereotypes of the scientist and the artist, the researcher and the creator

Firstly, we encounter the word “research”. According to the UNESCO definition, research is “any creative systematic activity undertaken in order to increase the stock of knowledge, including knowledge of man, culture and society, and the use of this knowledge to devise new applications.”[4]

Based on this definition, the researcher's identity is not determined, but it is stereotypical to connect the scientist with “research” and the artist with “creativity”.

If we present portraits of the scientist and artist from the point of view of a simplified and banal interpretation, we end up with a cultural construction which places both stereotypes into different ends of a value judgement.

The standard understanding that is fixed in the imagination of the common man about the scientist and artist puts them on different sides of rationality: one person of the mind and another person of feelings. The scientist is guided by rational thinking and

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[3] Gerfried Stocker / Christa Sommerer, HYBRID - living in paradox. — http://90.146.8.18/en/archives/festival_archive/festival_catalogs/festival_artikel.asp?iProjectID=13257

[4] OECD *Glossary of Statistical Terms*. — http://stats.oecd.org/glossary/detail.asp?ID=2312

the artist by emotions. The scientist and artist can be described as the "mad individualist", the "mad scientist", or the "hermitic artist", who has escaped into an ivory tower and is detached from social reality. On one side we see an image of Dr. Moreau or Frankenstein, and on the other side we see an image of a lonely and mad artist, such as van Gogh or Gauguin, one who has chosen inner and the other external emigration. This interpretation places creators at polar extremes, into a space without human communication, unavailable to ordinary people.

The public understanding of the relationship of scientists and artists in relation to the power infrastructure is diametrically different, when we understand politics and economics as power. Artists are understood frequently as fighters against power structures, rebels, and this is proved by contemporary interventionist art. Scientists are pictured as working for the military-industrial complex. Artists also live in an economic and social environment, obeying unquestioningly the rules of social dependency and interrelations.

While scientists are depicted as representing evil intelligence because of their connections with the military-industrial complex, artists are also not independent of economic sources of support. Artists do not refuse the opportunity to exhibit their works or the support of sponsors. The artist is not likely to start pondering his independence when an art academy offers him a job, or a military academy buys his artwork to hang in the lobby of its main building.

It is not possible to make generalisations about the independence of artists or scientists without looking closer at individual cases, not to mention the scale of good and evil. They represent the fields of science and art, which have certain social functions and their development is connected with the needs of society and people.

While science uses certain methods of approaching reality, art is understood as methodless, emphasising the random and chance as the basis of creative thinking, if we consider one of the few "methods" of art. But, even in science, chance is important, not only in the sense of the accidental falling of an apple on Newton's head being the inspiration for the theory of gravitation, but also in the sense that random conditions in scientific experiments give new results and become the basis for new knowledge.

German theoretician and new media artist Peter Weibel, who has written extensively on technological art during the last forty years, claims that science and art can be understood as methods: "This is our first claim: art and science can only reasonably be compared if we accept that both are methods. This does not mean that we declare that both have the same methods. We only want to declare that both take a methodological approach, even if their methods are or can be different."[5]

There are others, especially representatives of the contemporary trend of "artistic research", who justify the artistic method of enquiry as being as valuable as the scientific method.

In reference to the above-mentioned stereotypes, we can conclude that the distinction

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[5] Peter Weibel, The Unreasonable Effectiveness of the Methodological Convergence of Art and Science, in Art @ Science, Christa Sommerer/Laurent Mignonneau (eds), Vienna/New York, 1998, p. 170.

between scientists and artists on the basis of rationality/emotionality, common sense/madness, engagement/independence is irrelevant, especially in connection with contemporary art. Every human activity is based on both the intellectual and emotional. Discovering the new is frequently connected with a non-rational testing of borders, a kind of madness, an activity which doesn't have roots in common sense, and the realisation of bigger projects is connected with institutional work and collective collaboration.

Contemporary condition: collectivity and hybridity in art

The research-based or "scientific" approach in contemporary artworks is mixed with the traditional approach and is seen as new, recently born, a result of the new media era, but it existed earlier as well.

Visiting contemporary media festivals and conferences, such as Ars Electronica in Linz, Art+Communication in Riga and Transmediale in Berlin, you can encounter in exhibition spaces unusual materiality, creatures or objects, which seem to belong in scientific museums, zoos or botanical gardens. Robots gardening plants which are manipulated via the internet, or hamsters running to food stations; aquariums on wheels which are moved by Siamese fish; 3D animations created by touching plants; a performance artist moved by the internet. These works, made in the last fifteen years, are born from interdisciplinary and inter-material research and experiments, frequently through the enormous effort of collaborative teams. The common characteristic of these works is a digital base of input and output devices; audience participation with the artwork is digitally mediated.

We can find proof that we are in an important phase of changes in a book by Stephen Wilson, *Information Arts*.[6] In his list of contemporary science fields, we can see that in the hybrid research field artists are working individually as well as in collaboration with scientists or research centres.

Here we can add the trend of collaboration between artists and science centres, a good example being "Artists-in-Labs"[7], a project realised in Switzerland. Artists were embedded into science and research centres, where they realised their projects. The results were mostly illustrations of artistic ideas using scientific technology. Critically evaluating such artistic projects, it seems to me that they didn't achieve any new information; still, they are valuable attempts at establishing a new trend.

To exemplify the nature of the contemporary moment, collaborations between art, science and music can be added to the list, e.g. Xerox PARC, the Banff Centre for the Arts (Banff, Canada), ART+COM (Berlin), the Ars Electronica Futurelab (Linz), the

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[6] He describes common research and experimental areas of collaboration between art and science: biology (micro-biology, genetics, behaviour of animals and plants, processes of body and brain, visualization of the body and medicine); physics (particle physics, nuclear energy, geology, chemistry, astronomy, space research and GPS technology); mathematics and algorithms (algorists, fractals, genetic art and artificial life); kinetics (conceptual electronics, sound installation and robotics); tele-communication (telephone, radio, tele-presence and net-art); and digital systems (interactive media, VR, alternative sensors, haptics, artificial intelligence, 3D sound, speech, scientific visualization, surveillance systems and information systems). S. Wilson, Information Arts. Intersections of Art, Science, and Technology. The MIT Press, Cambridge, Mass., 2002, 945 pp.

[7] "Artists-in-Labs: Processes of Inquiry". Scott, Jill (Ed.) Springer Verlag, 2006, 136 pp and DVD.

Interactive Institute (Stockholm, Sweden), SymbioticA (Australia), Netzspannung.org/MARS (Germany), the Electronic Visualization Laboratory (Chicago), C3 (Budapest), IRCAM (Paris), V2 (Rotterdam), Zentrum für Kunst und Medientechnologie (Karlsruhe) and other centres and research institutions. There is no guarantee that these labs and centres will exist in ten years, but it is certain that, by combining the efforts of scientists and artists, a search for answers to ancient questions has occurred, and new trends in contemporary international art have been born.

The concept of Hans H. Diebner's "performative science" offers an example of hybridization in the fields of science and art. He has applied this concept since 1999, working at the Karlsruhe Center for Art and Media Technology. His work has involved communication between science and art and discussions about the question of how science can profit from artistic methods and approaches.

In the Estonian context, the exhibition "Harku 75" (1975) is an example of collaboration between scientists and artists. However, although there was a common management team, collaborative artworks were not made. An article by L. Lapin, "Objective Art" (1975), offers a positivist and technological approach to art. Another good example is the Soros Centre for Contemporary Art Centre's exhibition "Biotopy" (1995), an effort to connect artists' and scientists' competency.

The essence and structure of art and experimental technology centres have changed. Since 2000, after the hype about new media centres had ended, other artists have suffered from low funding.

At beginning of the 21st century, several new media practitioners began asking about the identity of centres for contemporary art and media. In 2005 this took the form of the change of the funding model of the Tokyo media museum ICC, which belongs to the Japan Telephone and Telegraph Company (NTT). In 2005 in the mailing list "Spectre", discussion of media centres of the 21st century occurred. These centres have resources for artists that have grown bigger as funds have become available for their support. As computers and video technology become cheaper, there is no reason to purchase them institutionally, which earlier, in the 1990s, was reasonable because of expensive and common use. In the contemporary situation, where the "centre" for digital art is the laptop of the artist, there is no need for centres as places for hardware.

On the other hand, the need for collaboration and collection still exists. As Annick Bureaud wrote: "If you want to have a 'collection' and do 'serious' work, then I guess you do need a big institution. Also, in some directions of 'media lab' without a stable, big institution, it is often hard to do 'real' work.
But I do think that institutions of different sizes with different goals are needed, especially for cutting-edge experimental projects."[8]

In her later remarks, Bureaud defined "cutting-edge" as "emerging practices" or new practices without previous analogues.

In conclusion, it is possible to define the main goal of the individual and institutional agents as producing "new practices", "emerging practices", and achieving new results

[8] Annick Bureaud, Re: the media art centre of 21C, Spectre, 9/8/05. — http://post.in-mind.de/pipermail/spectre/2005-September/005164.html

through them. Frequently the new practice is the result itself, which in the practice of art can be defined as a "method", a form of activity, which, connected with reality, results in a new point of view. This new view of reality can be defined as a goal of artistic activity, as a result and as a "product".

"Third culture"

At the beginning of the 21st century, C.P. Show's 1959 idea of a "third culture", which was discussed by him in "The Two Cultures", resurfaced. This is the merger of science and art, a bridge between the humanities and natural sciences. Works of technological, biological and transgenic character have been offered as examples in recent decades.[9] Here John Brockman's book *The Third Culture: beyond the scientific revolution* is quoted, where he says: "The third culture consists of those scientists and other thinkers in the empirical world who, through their work and expository writing, are taking the place of the traditional intellectual in rendering visible the deeper meanings of our lives, redefining who and what we are." [10]

The chapters are written by intellectuals of the "third culture".[11]

"Expository writing" does not actually exist in today's audio-visual time. "Life's deeper understanding" is mediated by film, computer animation and multimedia professionals, who, in collaboration with "scientists and thinkers", present professional knowledge in an understandable way. Presentation of scientific knowledge should no longer be only textual.

Science, as it is commonly understood, is defined by four rules. First, data is collected by measurements and observation. Second, common structures are sought which point to scientific theory, either qualitative or quantitative. Finally, new theories are tested and checked.

According to Webster's New Collegiate Dictionary, the definition of science is "knowledge attained through study or practice," or "knowledge covering general truths of the operation of general laws, esp. as obtained and tested through scientific method [and] concerned with the physical world."[12]

But, more broadly speaking, we can talk not only about connections of art and natural sciences, technological sciences and innovation, but also about the influence on art of philosophy, linguistics, psychoanalysis, semiotics, structuralism, sociology, biology, mathematics and medicine. These influences are clearly reciprocal, or at least art

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[9] Art&Science. Creative Fusion. European Commission, Directorate-General for Research, Brussels, 2008.

[10] John Brockman. The Third Culture. Beyond the Scientific Revolution, — http://www.edge.org/documents/ThirdCulture/f-Introduction.html

[11] Physicists Paul Davies, J. Doyne Farmer, Murray Gell-Mann, Alan Guth, Roger Penrose, Martin Rees, Lee Smolin; evolutionary biologists Richard Dawkins, Niles Eldredge, Stephen Jay Gould, Steve Jones, and George C. Williams; philosopher Daniel C. Dennett; biologists Brian Goodwin, Stuart Kauffman, Lynn Margulis and Francisco J. Varela; computer scientists W. Daniel Hillis, Christopher G. Langton, Marvin Minsky, and Roger Schank; psychologists Nicholas Humphrey and Steven Pinker. See http://www.edge.org/documents/ThirdCulture/f-Introduction.html

[12] http://www.sciencemadesimple.com/science-definition.html

people would like to believe so and think of art as a "method", a soft approach towards the solution of scientific problems.

The word "creativity" is considered to be a part of the vocabulary of art defenders, as though it is not part of all human efforts with novel ambitions. At the same time, even "science" is not a consistent sphere; it is divided into fields, which require different natural abilities and talents. When we compare biology, zoology, mathematics and physics, which belong to the applied sciences, even here there is an evident division between "soft" and "hard" fields. Speaking of natural sciences and the humanities, the former is more precise and cold, while the latter requires more compassion and empathy.

In the same way, we can discuss different fields of art. Some artists can be seen as "scientists", or representatives of a distinctive and precise way of working, as were Victor Vasarely and Manfred Mohr. Other artists are more "true artists", lacking any research-based approach to their art. They are like singing birds. In the category of 19th century predecessors of the research-based approach fall the inventor of photography, Louis Daguerre, who was a painter, and the inventor of the telegraph, Samuel Morse. Other talented men of the time were developing already existing scientific knowledge, but in their daily work they painted.

On the other hand, we can exemplify our approach with artists whose lives and work contain more spontaneity and uncontrolled activity because of the nature of their talent and through the coincidence of circumstances. These "chaotic", non-rational artists we know from art history as rebels and "mad" artists. Clichéd examples would include Vincent van Gogh and Salvador Dali. The latter was famous for his statement that the only difference between him and a madman was that he was not mad. Dali's arrogance was mainly constructed: he was aware of his public games, which were more of an outstanding sales strategy and a way to distinguish himself from others.

In connection with the "chaotic" and non-rational approach, some art history trends can be mentioned, including the automatism of surrealism, which involved a random search for artists' ideas. It was derived from the method of free association of psychoanalysis, which became the basis of abstract expressionism, inspiring the "abstract surrealists" Yves Tanguy, Joan Miro and Arshile Gorky.

Art can even be divided, in terms of manner of work and creative practice, into spontaneous and discrete art. Although this is a simplification, it is still relevant and we can define these "methods" as the chance-based and the rational approaches, both of which we encounter in works of the same creator.

Search for the new context in the sixties

Before discussing hybrid artworks and interdisciplinary art, the inspiring sixties should be mentioned as a historical intermedium which changed and shaped contemporary media and hybrid art. It was a period when technical experimentation was embedded into the system of contemporary art.

Attention should be focused on the following aspects that are evident in hybrid practices:

- research-based art

- group work

- use of computers and electronic technology in the context of visual art

- collaboration between representatives of different fields

Creators who started to work with new technologies shaped the understanding of artists' identity. There are several processes mentioned, especially in connection with the sixties. Certainly we can speak of a scientific-technical revolution that culminated in the excitement over space flights. In relation to art, the search for a new context is mentioned.[13]

Movement outside the commercial structure and into a new context happened in two ways: movement towards nature, and into "technology". As for the first movement, *Art and Technology* is an example, and for the nature movement, *Earth Art and Environmental Art*. The goal of both movements was to break down the borders of art and to change the commercial system of the art world.

György Kepes, Billy Klüver and Jack Burnham are mentioned as important catalysts of the "art and technology movement" in the US. György Kepes worked from 1946 on as a professor of visual design at the Massachusetts Institute of Technology, Billy Klüver was an electrical engineer at Bell Labs in Murray Hill, and Jack Burnham was a theoretician. Klüver communicated with the classics of pop art, including Andy Warhol, John Cage, Robert Rauschenberg and Jasper Johns. He collaborated with Jean Tinguely, helping to create the sculpture *Hommage à New York* in 1960.

György Kepes (of Hungarian origin) had the most important role in supporting artists' and scientists' collaboration. He worked in Berlin with Laszlo Moholy-Nagy in the 1930s, where Moholy-Nagy was connected with the heritage of Bauhaus. This collaboration continued in 1937 in Chicago, where the *light-and-colour department*, *Moholy-Nagy Institute of Design* or "New Bauhaus" was established. Kepes taught from 1946 in the Massachusetts Institute of Technology. There he established CAVS, the *Center for Advanced Visual Studies,* which emphasised the collaboration of scientists and artists. As Kepes intended, such a collaboration was provocative for scientists, who would through collaboration arrive at ideas which otherwise wouldn't be achievable. Many scientific discoveries have been initiated by visual and aesthetic experiences.[14]

In the same spirit, the CAVS-inspired MIT Media Lab is working in interdisciplinary work-groups today.

As with Douglas Davies in 1973, Kepes wrote in his book *The New Landscape in Art and Science* on art and science as fields using visual tools. Certain forms and shapes are visible only through new optical devices, such as technology meant for infrared or ultraviolet vision, X-rays, and microscopic and telescopic technology. For such visualisation, Kepes arranged the exhibition "The New Landscape" in 1951, where microscopic and macroscopic images by scientists were shown together with artists'

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13 See Marga Bijvoet, Art as Inquiry: Toward New Collaborations Between Art & Science, Oxford: Peter Lang, 1997.

14 D. Davies, Art and the Future. Praeger Publishers, New York, 1973, p. 119.

analogue images.[15]

The movement “Experiment in Art and Technology” (EAT) played a remarkable role; it was established in 1967, a year after the event “9 Evenings: Theatre and Engineering”. It was a non-profit organisation for advancing collaboration between engineers and artists. The founders were Billy Külver and Fred Waldhauer, and two artists: Robert Rauschenberg and Robert Whitman. Klüver stated that science, technology and art were tightly connected. Despite his legacy in the history of technological art, his works are not very well known and have not received critical recognition. Klüver's legacy in the history of media art is much wider than only the use of new technologies and tools.

He tried to connect art and science and, in doing so, he wanted to bring artists closer to technological material and connect them with forces which formed contemporary society, especially the cultural changes of the 1960s. Klüver introduced the world of artists to scientists, believing in mutual understanding. These ideas became the basis for the collaborative work of contemporary engineers and artists.

In the information letter of EAT of 1 June 1967, Billy Klüver and Robert Rauschenberg wrote: “E.A.T. leads artists to achieve new art through new technologies and to work towards professional recognition in engineers' society.”[16]

The event “9 Evenings: Theatre and Engineering”[17] was arranged by artists and engineers and it is seen as a predecessor of contemporary multimedia performances. However, the New York audience, spoiled by Broadway, complained about imperfect performances, but according to Klüver they were successful. His opinion was that it was irrelevant whether technology was functional or not. The relationship between artists and technology could be intuitive and experimental, in the same way as scientific research, and full of risks.[18]

The most ambitious project was E.A.T.'s Pepsi Pavilion for EXPO '70 in Osaka, Japan. Klüver's intention was to create a lab environment, encouraging a live programme which offered experimental opportunities instead of using determined or “dead programming”, as he called it, which was typical of other exhibition pavilions. To achieve that goal, he assembled a team of artists, engineers, scientists and architects. As a result, a spherical dome was built, with a height of about 10 metres, that was surrounded by a steam cloud hovering over the pavilion. The interior, covered with mirrors, played electronic music, and freedom of participation was

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15 Ibid, p.119.

16 D. Davies, Art and the Future. Praeger Publishers, New York, 1973, p. 137.

17 In 1965 Billy Klüver, with the help of Robert Rauschenberg, found competent engineers at the Bell Laboratories (Murray Hills, New Jersey, U.S.) to participate in an interdisciplinary project which connected avant-garde theatre, dance and new technology. Ten artists participated in projects (John Cage, Lucinda Childs, Öyvind Fahlström, Alex Hay, Deborah Hay, Steve Paxton, Yvonne Rainer, Robert Rauschenberg, David Tudor and Robert Whitman) and created original performances. Artists worked with engineers, who helped to create technical components. (see Collection of Documents Published by E.A.T., 9 Evenings: Theatre and Engineering (1965-1966) http://www.fondation-langlois.org/html/e/page.php?NumPage=396) Engineers spent more than 850 hours on preparation, which cost $150 000, and later spent 2500 hours. During nine days of performances, 10 000 people attended. D. Davies, Art and the Future. Praeger Publishers, New York, 1973, p. 69.

18 D. Davies, Art and the Future. Praeger Publishers, New York, 1973, p. 69.

offered to visitors. They had to create their own experience.[19]

In the context of contemporary art, the intention of "making one's own experience", openness as opposed to "dead programming", is a quite innovative part of participatory, relational and interactive art. Keeping in mind the various backgrounds of E.A.T. members, their activity is an example of interdisciplinary and hybrid realisations.

As a result, new types of authors have emerged: artists-engineers, artists-researchers, artist-designers and artists-managers.

To this discussion we could add the exhibitions of **Nove Tendencije** ("New Tendency", beginning in 1961) in Zagreb. "New Tendency" became an international movement in 1961-73, where artists from Yugoslavia, Italy, Austria, Switzerland, Germany, Hungary, Argentina, Spain, Holland, the USA and other countries participated. Their formation and development was influenced by the relationship with the Paris group GRAV (Groupe de Recherché d´Art Visuel), with whom they collaborated in 1962-63.[20] "Research" was part of GRAV's name. "New Tendency" avoided the term "computer art" and used "visual research". The word "research" ("recherché") was added to the title of the group in 1963: Nouvelle Tendance – recherché continuelle (NTrc).[21]

Their goal was mostly scientific and "rational" research on visual perception and art, as well as defining terminology more precisely to avoid translation mistakes. Methods of natural science, such as objectivity, transparency and controllability, promised new artistic legitimation. Also, they attempted to abandon the former definition of geniality, which is a by-product of a sacral understanding of creativity, and emphasised lifting artistic research to an objective and collective level. Here they leaned toward the experience of classical avant-garde, De Stijl, Bauhaus and constructivism, and opposed themselves to abstract expressionism, informal art and tachism.[22]

These examples of experimental activity in art, science and technical innovation in the US and Europe reflect an ambitious effort, which resulted in a completely transformed artistic environment.

In conclusion, I would like to list the main results of the legacy of the 1960s:

- Synthesis of the field and collaborativity. Artworks and performances were created as the sum of a hybrid competency of artists, technicians, engineers, musicians and scientists.

- Artwork had "open programming": viewers could compile their own experience.

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19 D. Davies, Art and the Future. Praeger Publishers, New York, 1973, p. 137.

20 M. Rosen, Die Maschinen sind angekommen. Die [Neuen] Tendenzen – visuelle Forschung und Computer. - bit international, [Nove] tendencije – Computer und visuelle Forschung Zagreb 1961-1973. Hg. Peter Weibel und Margit Rosen. ZKM, Karlsruhe, 2008, p. 39.

21 M. Rosen, Die Maschinen sind angekommen. - Die [Neuen] Tendenzen – visuelle Forschung und Computer, p. 40.

22 M. Rosen, Die Maschinen sind angekommen. - Die [Neuen] Tendenzen – visuelle Forschung und Computer, p. 40.

- New technology was used in the making of artwork.

- Creative work was preceded by research, which meant new technical and visual solutions.

On hybrid artworks in the context of research-based art

The word "hybrid" has been used in art for decades. In the 1960s artists and engineers designed synthesizers of sound and image, as they can be referred to according to Steina and Woody Vasulkas's classification: *Hybrid digital/analogue audio synthesizer* (Pulsa Group, P. Kindelman 1968), and *Hybrid audio/video Installation* (Behrman, Diamond, Watts 1974).[23] They carried on the work on hybrid and synaesthetic machines that had begun in the arts earlier.

In terms of the synaesthetic dimension, we can mention Oscar Fischinger's films and his "Lumigraph", Mary Ellen Bute's synaesthetic film practice, Thomas Wilfried's "Clavilux", Charles Dockum's "MobilColor Projector" and other screen-based or object-based practices and artworks in the first half of the 20th century, which were meant to evoke hybrid sensorial and synthetic experiences. Creators experimented with expansive new technology, such as electricity and colour film.

The term "hybrid/hybridity" was used in the practice and texts of Ars Electronica festivals years before the birth of the "hybrid art" category: hybrid space (Hybridräume, 1997), hybrid workspace (1998), hybridity of media (Hybridität von Medien), hybrid culture (Hybridkultur, 1996), Hybridation (1986), Hybridsystem (1979, 2002), hybrid computer (Hybridrechner), analogue-digital hybrids (analog/digital-Hybriden, 1992, 1977), hybrid man-machine systems (Hybride Mensch-Maschine Systeme, 1992), and hybrid automata (hybride Automaten, 1990).[24]

In the following, I will discuss more specifically hybrid and research-based projects, whose character is a collaborative and mediated way of acquiring knowledge. A valuable aspect is the independence of the project, that the project is not definable under some narrow category – it is inter-disciplinary and hybrid.

With the following examples, it is possible to draw parallels with the art of the 1960s, through the same traits: that there is research-based art, group work, a sum of different competencies and the use of computers and electronic technology.

I will focus attention on Ars Electronica's hybrid art definition, which was inspired by biology. Members of the jury wrote in 2007 that they had abandoned, in the selection

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23 CLOUD MUSIC (Hybrid Audio/Video Installation), 1974-1979 Robert Watts, David Behrman & Bob Diamond. - http://90.146.8.18/de/archiv_files/19922/1992b_152.pdf. Check also: Woody Vasulka / Steina Vasulka, Pioneers of Electronic Arts http://90.146.8.18/en/archives/festival_archive/festival_catalogs/festival_artikel.asp?iProjectID=8858

24 Gerhard Dirmoser's research was used for the compilation of this list: "25 Jahre ars electronica – Ein Überblick als Gedächtnistheater", TransPublic Linz, 2004. - www.servus.at/kontext/ars/

of hybrid art, “data translation art” and “works based on the notion of universal code and information technologies works that increasingly inform matter by combining more specific and contextualised codes and material technologies”.[25]

As the organisers wrote, a great number of submissions dealt with climate change, ecology, Second Life and telesurveillance; others contained elements of telepresence, brainwave and electromagnetic interfaces, and presented video-enhanced stage performances and media architectures, such as “skins” for public spaces. While they expected that potential award winners would emerge from these clusters, these works finally appeared as quite predictable fusions and surprisingly were eliminated throughout the selection process.[26]

> “What counted more have been their quality of appropriate intermediality and their ability to condense their complexity into intriguing trompe-l'oeil 'one-liners' — between operationality and symbolism — in which mediated experiences become tangible.”[27]

Yann Marussich's “Bleu Remix” (2008) is a performance in which the author lets blue secretions come through his skin. The author works with doctors in order to simulate a mutation of his body through biochemical transformations. He calls it a dance; his interior becomes his exterior. In that way, he invites the viewer on a trip through his body. Music during the performance is composed in real-time.

> The author writes:
> “The challenge I am taking up is to do a show on motionlessness, trying to prove that it is central, and the basis of any movement. I want to smash our way of viewing motionlessness. Make the motionless body a monochrome vibration that hints at the problem of the relationship between outward immobility and inner mobility.”[28]

From the audience’s point of view, the most amazing thing is the gradual visual transformation. The performer “bleeds” blue liquid. Viewers who surround the performer are much more active and vivid. His sweat, saliva and tears are transformed into a dark-blue liquid, evoking admiration and amazement. The main trigger for this reaction is the subconscious feeling of fear that is connected with seeing body secretions, which remind us of injuries, sickness and death.

Naturally, every person influenced by art historical visuals has in his visual memory images of martyrs; the strongest connection is evidently with Jesus Christ. Yann Marussich places his performance and body into a heavily loaded context of visual

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25 Tim Edler, Yan Gong, Jens Hauser, Richard Kriesche, Michael Naimark, Pervasive Intermedia—Searching and Finding Criteria in the Open Space of Hybrid Art. – CyberArts 2008, International Compendium Prix Electronica. Eds: Hannes Leopoldseder, Christine Schöpf, Gerfried Stocker. Hatje Cantz Verlag, Ars Electronica 2008, pp. 96-97.

26 Ibid., p. 98.

27 Ibid., p. 98.

28 CyberArts 2008, International Compendium Prix Electronica. Eds.: Hannes Leopoldseder, Christine Schöpf, Gerfried Stocker Hatje Cantz Verlag, 2008. p. 112.

and cultural memory, causing a chain of connections and emotions.

However, he writes that he doesn't want to show suffering, but the strength that you can draw from your own suffering.[29]

From another perspective, his inspiration is butoh-dance, from the point of view of slow movement. This brings in Marussich's interpretation of the body being closer to the rhythms of nature. This is an attempt to approach a plant-like rhythm. In "Blue Remix", the non-moving dancer is not a provocation, but has very much to do with getting back to where it all starts.[30]

The New York artist **Brandon Ballengée** began his project "Malamp UK" (USA, 2008) in 2006, in scientific collaboration with Dr. Tim Halliday, Dr. Stanley Session and Richard Sunter. This is a multidisciplinary and transdisciplinary work, which is based on information collected from the lab and the environment. The project, commissioned by The Art Catalyst, involved research on the condition of British amphibians. Within a week, the artist had found dozens of unusual toads and frogs at a site in Yorkshire, England. As an "eco-activist", the artist invited the public to participate in the scientific field research, believing that interaction was the basis for social change. Acting as biologists, the public could see the biology of their close surroundings. At times, degradation was uncovered. In one area of England, near a scenic residential garden pond, in an artificial vision of tranquillity, there were monstrous creatures sculpted by the environment. The experience of the audience was emotionally complex, often uncanny, and hopefully changed people. The dual project of art and biology was the artist's attempt to sculpt society. [31]

Visually the project was surprising and unexpected, as it showed the depth of biological transformation. Though it was claimed that the frogs' mutation was not clear, it was clear that there was a problem in the environment. People are chemically detached from the natural environment; the physical and body-related connection with nature is not direct. The influence of civilisation on biological organisms is not understood. But people also belong to the biological environment. Therefore, changes in amphibians indicate the condition of the environment that people share with frogs.

The hybridity and transdisciplinarity of the project, the connection between different fields of science and presentation practices are evident and don't require comment. It is evident that showing scientific facts to the public through participation and not a scientific article makes the idea understandable and accessible.

Helen Evans, Heiko Hansen / HEHE: Pollstream - Nuage Vert. The duo HEHE developed the Pollstream project as a series of interventions and installations in 2002-2008. The project researched man-made clouds in terms of their cultural and political meaning. The duo constructed a series of public actions and a non-utilitarian design which culminated in the Nuage Vert action in Helsinki: the vapour emissions of a coal-burning power plant were illuminated with green laser animation, drawing an outline of the moving cloud onto the cloud itself and turning it into an attractive sign

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29 Ibid, p.112.

30 Ibid, p. 113.

31 http://www.artscatalyst.org/projects/detail/amphibians_study

of the city which responded to the local energy consumption.

The artists motivated several thousand residents to limit their energy consumption by unplugging their electrical devices, and Nuage Vert temporarily lowered energy consumption to 800 kVa. Spent energy was "wasted" to project a green cloud on the vapour cloud. The project required years of public negotiation. Partners from laser physics, computer science, electronic engineering, energy producers, air-quality monitoring organisations, cultural institutions, environmental activists and a governmental energy awareness agency took part.[32]

In addition to an impressive list of collaborators, the project offered clarity to the public; it was very understandable and created standards for future hybrid projects. The project contained a self-evident level, was open for collaboration and represented certain moral and world-improving dimensions, allowing citizens to participate in saving energy and nature.

The following are other example projects containing such criteria as collaboration, inter-disciplinarity and strong consistency.

Eduardo Kac's famous "Natural History of the Enigma" was awarded the Goldene Nica at Ars Electronica 2009. It was a collaboration with the scientists Neil Olszewski, Department of Plant Biology, and Neil Anderson, Department of Horticultural Science, University of Minnesota, St. Paul, MN.

Kac called his creation "plantimal", from "animal" and "plant". The project took place in 2003-2008, with the goal of creating an interspecies organism, which was called Edunia – derived from Eduardo and petunia. As the basis for a genetic experiment, Kac's and a petunia's genetic material was used.

Ten years earlier, Kac had presented the project "Genesis" at Ars Electronica and later created the scandalous "GFP Bunny" – a rabbit that glowed in UV light. While earlier genetic experiments had been associated with fear, now they were accepted warmly, explained Kac. [33]

Edunia produced its own protein. A plant is able to produce protein, and multiply its genetic material only if physics and nature make it possible. And finally, as Kac claimed, plants and people have common predecessors. Kac's merging of plant and animal was nothing more than going backwards in evolution, in time. This fact brought interesting tension into this work.[34]

In the end, Kac quoted a poet from the beginning of the 20th century who thought that poets should write a poem like a tree grows. In Kac's opinion, an artist should grow a tree like writing a poem. [35]

Finally, there is the example of Stelarc's "**Ear on Arm"**. We are dealing here with a

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32 Pollstream, Helen Evans, Heiko Hansen / HEHE. CyberArts 2008, International Compendium Prix Electronica. Eds.: Hannes Leopoldseder, Christine Schöpf, Gerfried Stocker Hatje Cantz Verlag, 2008, p. 106.

33 Ars Electronica forum, September 2009. Author's notes.

34 Ibid.

35 Ibid.

stupendous experiment, which in the context of art is classified as similar to other body-based, plastic surgeries, like Orlan's projects. Stelarc, in collaboration with his partners,[36] added to an arm an ear-like anatomical object that was perfectly connected with the body. At first, a wireless mic was placed in the "ear", but because of the possibility of infection it was removed. The project dealt with the author's earlier idee fixe and the original plan involved using a face, but this was abandoned at the suggestion of specialists.

Again, we can see that without the involvement of experts and the support of sponsors, the project couldn't have been conceived. The artist presented his idea and his own body. The body was an instrument and meant to be a part of the artwork itself. Conceptually, Stelarc was following his "prosthetic body" concept, in a wider sense emphasising that our bodies are re-shapeable by technological tools.

I would like to limit this list to five examples, excluding projects with a social dimension, as for instance Johannes Gees's "Salat" (2008), Julian Oliver's (NZ/DE) and Danja Vasiliev's (RU/DE) net and security critical project "Men In Grey" and "Newstweek", Paul Vanouse's (US) "Ocular Revision" (2010), which is in some ways an extension of his earlier "Latent Figure Protocol", as well as Steve Lambert's (US) "The New York Times Special Edition" (2009) and Charlie Todd's (US) "Frozen Grand Central" (2008). Gees's and Vanouse's projects seem to be mostly individual works, and Steve Lambert's fake "New York Times" was published with the help of several dozen activists and writers.

Conclusion

In the above-mentioned five projects, and to some extent in other projects, we can see artists' strong realistic approach. The borders of authorship are blurred by the fact that the projects were realised collaboratively, or the author is in some way a performer, the presenter of the project through his own body, as with Yann Marussich and Stelarc. In both projects, the artist is both the initiator and coordinator of the collaboration.

In all five projects, it is evident that they are based on scientific research, experiment or technology, and on very rational professional practice. Contextual interpretation added to the projects makes them into clear statements; in the end they are appreciated by art professionals as distinctive and valuable.

I would add a final discussion on the question of to what extent hybrid projects are truthful and adequate. In connection with Kac's project, I have heard critical comments by biologists who have claimed that such a manipulation is impossible. Who knows? My level of competence is not sufficient to evaluate the biotechnological details properly. Other projects of the five discussed above seem to be more convincing, as the visual and material effect is evident, and they don't need additional proof.

This brings us to the question of the simulativity of other hybrid and interactive

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[36] Surgical team: Malcolm A. Lesavoy, MD, Sean Bidic, MD and J. William Futrell, MD http://stelarc.org/?catID=20242

projects. The artist's experiment is different from the scientist's experiment in that verification is not needed. The results of artists' research are presented as visualised, digitized or objectified statements. This is "verified" or not by an art critical text. It may be that subjective, non-truthful and even fake artworks based on scientific knowledge acquire value in social communication, impacting the audience or art context in an original way. While in science projects are evaluated as truthful or fake, in art the truthful (or communicative art) could be fake and the fake (or non-communicative art) could be an artwork that is too much related to truth.

The goal of this text was to give a consistent impression of collaborative and hybrid art practice in the context of visual art in its historical and contemporary perspective. The term "research" is a topic of discussion in connection with science and art. Though truthful artistic research is not similar, in terms of criteria of objectivity, to scientific research, we still see a persistent intention from the 1960s on to create "objective art", to explore science-based practices which during the 1960s were based on research of visual perception and new technology.

Research-based art is connected with the development of doctoral programmes in art universities. We can say that there is pressure to raise research quality, proven through a larger number of defended PhD theses. In this context, artists are trying to realise inter-disciplinary hybrid projects, to reflect their creation and to move, using new methods, towards unique results. Although this paper intentionally avoids diving deeper into details and examples of practice-based PhD research, a deeper exploration of this subject would undoubtedly provide a further relevant area of discussion in connection with the theme of hybrid art practices.

In conclusion, this paper has shown that the ambition to create art which is based on research □ where group work and collaboration between different fields is involved and where authors are using state of the art technology □ has a definable history in contemporary art as well as a strong presence in the new media art scene.

Certainly one reason for the development of the hybrid art trend is the natural curiosity of creative people, their desire to try new ways and expand previous medium- or style-oriented art possibilities.

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