

THEORETICAL DISCOURSE ON “ART, SCIENCE AND TECHNOLOGY COLLABORATION” AND ITS HISTORICAL DEVELOPMENT

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The paper analyses historical development of a discourse on “Art, Science and Technology collaboration” from the 19th century till the present. It reviews the key concepts used for a theoretical and cultural legitimization of this collaboration, and implications of the “collaboration”-discourse for a media art practice.

"I forgot who was the famous philosopher who used to quip that all was well with the social sciences except for two tiny words: 'social' and 'sciences' – with these words Bruno Latour begins his famous article "When things strike back - a possible contribution of science studies." [1] One could probably slightly modify this introductory rhetorical construction to introduce also the most popular subject in the today's media art discourse: Actually, all is well with the “art-science collaboration” except for three tiny words: “art”, “science” and “collaboration”.

Surely, a “fruitful collaboration of art and science” has a long and rich history and its importance is not to be questioned. But the problem that we are going to analyse in this paper is the growing instrumentalisation of this subject caused by current tendencies in cultural policy and its consequences for a contemporary media art practice.

A common allegation that this “collaboration” is indispensable entails a danger to eliminate not only practically, but also discursively an old good modernist autonomy of art. Attempts to make the system of art education and art practice itself more academic and more ‘scientific’ are not just an outcome of the notorious Bologna-process, but also a manifestation of some much older structural problem resulted from a traditional role of contemporary art in the society. The worse its precarious position gets, the more intensively a mutual enrichment of both art and science through their fruitful collaboration and the perspectives of their desired symbiotic future are depicted. Publically expressed scepticism and irony towards this agenda are perceived as a kind of a guild interests betrayal and career suicide. The functioning of today's ideology machinery is not any more based on a classical Marx' naiveté-model “They do not know it, but they are doing it”, but rather, as Sloterdijk and Žižek have already poited it out, on a maxim of the so called “cynical reason”: „They know very well what they are doing, but still, they are doing it.“ [2]

“We know very well that “scientification” of art often brings quite dubious artistic results, but in spite of that we still make it to our official agenda” – this statement could be an articulation of a common attitude within an institutional art and especially new media art field. Because an integration of media art theory and practice into an academic science context promises at least few jobs and teaching positions, while critical questioning usually ends up with an absolutely unbeneficial resentment.

These observations prove an efficiency of familiar repression mechanisms in service of ideology apparatus, which transform this “cynical reason” background into some saving “new naiveté” that noticeably

coins the present discourse of “art-science collaboration” and invites for an application of discourse analysis methodology in its classical Foucauldian version.

Let us first briefly overview a conceptual history of this discourse and some key notions that were used to theoretically legitimize this “collaboration”.

The Renaissance-career of an artist from a simple craftsman to a man of universal knowledge is a well-studied subject of art history. Functional division of labour between art as producing *techne* and science as analytically-contemplating *theoria*, articulated already in Plato’s and Aristotle’s texts, is often considered to be left aside in early Modern epoch. The whole history of Fine Arts from the treatises on central perspective in the late Renaissance to manipulations with DNA-code in bio-art projects is supposed to deliver further proofs of the on-going “scientification” of art. But actually this process proves only the fact that the old, by Plato established hierarchy, in which scientific activity has a higher social status than artistic one, remains essentially unchanged. However the reason for this higher prestige of science has changed as well as a factual content of scientific activity.

Science today is not anymore some pure self-sufficient reflexive and contemplative *theoria*, but, similar to any other forms of current public production, is a complex of rational goal-oriented activities, aimed at achievement of particular practical results. Being oriented primarily at solving certain practical problems natural sciences take today in economical perspective entirely different position than contemporary Fine Arts with an essential for their conceptual identity claim for autonomy. This inevitably shifts an economic value of Fine Arts into a category of luxury and “status symbol” goods. Natural sciences are considered to be ‘useful’ for a society and (even if in a long-term perspective) economically efficient, while Fine Arts can be only partly used as storage for a temporary economical surplus. In addition, this temporary storage can only function, if its real economical meaning is kept hidden behind the façade of the key ideological concepts that build bourgeois notion of art, such as “creativity”, “geniality”, “self-expression” etc.

Historical basis of this economically grounded demarcation is a direct use of scientific achievements for technical innovations during the period of the so-called “industrial revolution”. In his early text “Technical Progress and Social Environment” famous German social philosopher Jürgen Habermas has pointed out that pre-industrial forms of practical professional activity didn’t imply any connection with the theory. [3] Only with the process of industrialisation a systematic implementation of scientific achievements in the practice has been started. Natural sciences thus became a source of new technologies and inventions, which could result from this implementation.

This was accompanied with the process of institutionalisation and professionalization of sciences themselves, which was manifested in a differentiation of different scientific disciplines and establishment of particular institutions like Academies of Science etc. A new social group of professional scientists has emerged, who were driven in their undertakings not only by a kind of “the will to knowledge”, but who also could make their own livings out of this activity. This process is also manifested in the English-speaking context by an emergence of the very notion “*scientist*”, which slowly replaces some earlier terms such as “*natural philosopher*” or “*man of science*”.

British polymath William Whewell has introduced the term “*scientist*” in one of his texts published in 1834 in *Quartely Review* as a reaction to a changing character of scientific work. This introduction had first a slightly satirical tone: „by analogy with *artist*, they might form [the word] *scientist*, and added that there could be no scruple in making free with this term since we already have such words as economist

and atheist.“ [4] But later, in his “*The Philosophy of the Inductive Sciences*” (1840) Whewell was not any more ironical about this term: „We need very much a name to describe a cultivator of science in general. I should incline to call him a *Scientist*. Thus we might say, that as an Artist is a Musician, Painter, or Poet, a Scientist is a Mathematician, Physicist, or Naturalist.“ [5]

But a real popularity the term *scientist* has reached only at the end of the 19th century. Opposite to German term *Wissenschaft*, French *science* or Russian *наука*, the use of the word *science* in the English-speaking context became reserved for exclusively for natural sciences related activities, while *humanities* (in the continental Europe largely known as *Geisteswissenschaften*) could hardly claim for the status of scientific activity. Since Francis Bacon British “men of science” were primarily empirically and practically experimental oriented, in contrast to their continental colleagues with their affinity for voluminous metaphysical speculations. A notoriously pragmatic Anglo-Saxon spirit has conceived practically useless non-profit *humanities* as a kind of wasteful, but in fact pretty harmless pastime for „*gentlemen of leisure*“ with „old money“ and „old privileges“ similar to *Fine Arts*.

Following this general ‘ideological’ predisposition the theme of an interaction between *art* and *science* in the 19th century implies first of all the question, what Fine Arts can learn from Sciences in order to become ‘finer’. A theoretically articulated programmatic rapprochement of art to science, e.g. to scientific knowledge and methods, had initially a purely instrumental background. For instance, John Ruskin in his „*Lectures of Art*“ (1870) and in „*The Eagle’s Nest. Ten Lectures on the Relation of Natural Science to Art*“ (1872) claims that landscape painter should study biology and geology and also use scientific drawing methods, to be faithful to the nature in their works, which is, according to Ruskin’s theory of art, one of the main virtues of Fine Arts. [6]

A further development of an instrumental approach to scientific knowledge and methods and their use for artistic purposes one can find at the beginning of the 20th century in the theory and praxis of Russian constructivism of the 20ies and in the study programs of Bauhaus.[7] The famous constructivist concept of “artist-engineer” should not be misunderstood as a sort of prelude to the today’s “art-science collaboration” agenda. Prominent representatives of Russian constructivism, such as Alexander Rodchenko, Warwara Stepanowa or Alexei Gan, spoke about „production art“ (russ.производственное искусство), which makes a radical break with the *l’art pour l’art* attitude and formal aestheticism of traditional Fine Arts and offers instead an agenda of a better designing of human material environment. The new type of artist – “artist-engineer” – should resign traditional art forms like panel painting and „consciously manufacture useful things“, i.e. s/he should get involved into designing and production of functional objects. A prominent LEF-theorist Boris Arvatov wrote in one of his articles that the mission of a modern artist is “not to depict a beautiful body, but to educate real and harmonic people, not to draw a wood, but to plant parks and gardens, not to decorate walls with paintings, but to paint these walls.” [8]

The notion of “production art” breaks in its basic attitude with the modernist ideology of art autonomy. The “production art” as such is an important theoretical forerunner of the contemporary conception of design; therefore an “artist-engineer” should be understood rather as a designer than as an artist in a conventional modernist sense.

In the first half of the 20th century artists not only very often refer to the modern scientific theories, but also apply some newest technologies in their artistic practice. However this turn to science and technology does have yet neither from the art-historical, nor from discourse-historical perspective any programmatic strategic character. A proclaimed “collaboration” of art, science and technology as well as

certain “scientification” of art practice becomes a more or less articulated agenda only in the 1960ies, largely due to the cultural policy situation in the USA at that time.

In a situation of the armaments drive and generous support of research projects in the field of computer technologies during the Cold War in the USA, American universities and research institutes became a feeding ground for experimental technology-based art projects, which could provide a needed technical production base.

Numerous new art forms, practices and –isms emerged out of intense late-modernist impetus of the post-war art. They developed further a conceptual heritage of the early modernist art (from Dada and Suprematism to Constructivism and Bauhaus) and transformed it according to the changed social and technological environment. Endlessly created new art isms represent this wide range of artistic experimentation with new technologies, materials and scientific conceptions – *Computer art, Algorithmic art, Generative art, Information art, Evolutionary art, Process art, Systemic art, Cybernetic art, Kinetic art, Fractal art* and so forth, and so on.

These artistic experiments needed of course a production base, which goes far beyond the possibilities of traditional artist studio. Art institutions of the 60's-70's could offer only exhibiting spaces for a public presentation of these artworks. Appropriate production facilities could be however found only outside of the art institutions context of that time.

Laboratories and research centres at the universities offered in contrast to art institutions not only some technological and material production base, but also support from engineers and programmers, indispensable for a realisation of these artistic projects. This is of sure not a coincidence that many pioneers of computer- and technology-based art come precisely from this context and have their background in natural or computer sciences and engineering.

To mention only the most known examples, a famous pioneer of *interactive art* and earlier artistic experiments with *virtual reality* and *augmented reality* Myron Krueger was a computer scientist, who in the 70's has worked for computer graphics projects at the *Space Science and Engineering Center* at the *University of Wisconsin-Madison*. Due to this job he could get a technical support of his artistic projects from a University staff.

A founding editor of *Leonardo-Journal* and devotee of *Kinetic Art* Frank J. Malina was originally an aeronautical engineer. Many European techno-art activists also came from similar professional contexts. A well-known Austrian enthusiast of computer art and computer graphics Herber W. Franke received his doctorate in theoretical physics in 1950 by writing a dissertation about electron optics. One should not forget here also Roy Ascott, who, before starting his artistic career, was an officer in the British Royal Air Force working with radar defence systems.

From the historical sociological perspective in the second half of the 20th century precisely scientific and technical manpower was primarily a feeding ground for a technology-based art, which has essentially influenced some of its aesthetical and conceptual particularities. Many protagonists of early techno-art were professional engineers, programmers or scientists, who out of various reasons have developed their interest for artistic use of some new technologies. With their technical-artistic experiments they were *stricto sensu* hobby-artists, who, from a sociological perspective, have been producing a sort of 'technological Art-Brut.'

In this respect one could also say that many early technology-based art projects, whether in the field of *Kinetic Art*, *Holography*, *Computer Art*, *Interactive Art*, *Virtual Reality* or something else, were to a certain extent side-products and experimental deviations in a functioning of different research institutes and scientific laboratories.

Only later these products of rather creative than artistic in a strict sense activity were perceived within an institutional art field as art objects and interpreted as an extension and further development of the modernist art concept. The idea of "Collaboration of Art and Science and Technology" became thus pivotal for a conceptual self-positioning of New Media Art in the 80's.

A critical analysis of the discourse on "Art-Science collaboration" discovers also certain topoi, which play a noticeable role for a theoretical conceptualisation of this subject, although this role was taken due to some initial principal misunderstanding. One of these topoi, which is largely referred in numerous works on history of the "collaboration", is the famous text "The Two Cultures" by British scientist and writer Charles Percy Snow. He describes an essential difference between the *science* culture and *humanities* culture, i.e. between the working methods, canons, systems of values etc. of „*scientists*“ and „*literary intellectuals*“ (that is how Snow defines representatives of humanities). His main pathos is to settle account with a notorious intellectual arrogance of "*literary intellectuals*", and it is absolutely unclear, what techno-arts have to do with the contraposition of these "two cultures". Since if they are supposed to have something in common at least with one of them, then it should be rather a kind of 'genetic relationship' with *science* and not with *humanities* (at least precisely this suggest the most publications on this subject).

That is also why the whole "*third culture*"-motive, which is very common in the media art discourse since 90ies, is based on some fundamental misinterpretation of both the Snow's position as well as main statements of the book „*The Third Culture: Beyond the Scientific Revolution*“, published in 1995 by John Brockman, an American literary agent and author specialising in scientific literature. In contrast to Snow, who optimistically wrote about a possible "*third culture*", in which fundamental differences between *science* and *humanities* can be abolished through the communication between their representatives, for Brockman "*the third culture*" is represented by scientists, who are able without a mediation through literary intellectuals to present themselves the newest scientific developments to the general public.

Despite these definitions the term "*third culture*" was in the 90ies often used in the media art discourse to position media art itself as a new kind of the "*third culture*".[9]An intention of this positioning is quite clear – art, which works with technologies (i.e. media art par excellence), should be established in an academic institutional context and socially legitimized as a kind of mediator between science and general public.

Especially in the USA, where media art institutions were not that actively founded and generously supported by the state as in Europe in the 90ies, media art had a chance to institutionally survive only under the roof of universities and other academic institutes. Teaching and research positions in the academic field became for media artists almost the only professional option to make their living. But even if this positioning tactics in a sociological perspective is very understandable and even unavoidable, one should not ignore those conceptual problems and contradictions, which in a long-term, strategic perspective can lead media art to a real dead end.

Through accepting this merely mediating position, media art basically reduces itself to a kind of popular-educating and purely illustrative work. As a matter of fact, only through an abdication of its artistic autonomy and functional self-sufficiency media art can obtain an approved place in a social system. However the main question, which this situation provokes, is the following one – why does media art that positions itself in this way still need this disputable “art”-addendum, which only brings various practical complications and theoretical contradictions into this kind of activity? Why it does not call itself simply an audio-visual-spatial-etc. design and representation of scientific knowledge and technological achievements, which it does in fact?

Looking back to the history of art in the 20th century this would not be such a radical move. Was the “production art” of Russian constructivists not the first sober perspective onto upcoming tasks of art in light of its disappearing monopoly of visual production due to technical inventions such as photography or cinematography? Or was it not proclaimed by Gene Youngblood in “Expanded Cinema”, that artist should become a “design scientist” and practice an “aesthetic application of technology?” [10]

The “art”-label in the whole today’s media art enterprise should probably simply help to keep at least some tiny free space in an increasingly efficiency-oriented academic context of the present neoliberal policies. In addition, the term “art” in a mass reception is still reserved for some imagined romantic terrain of an alleged “freedom of individual self-expression”, which keeps on recruiting new apprentices into a shrinking media art guild.

References and Notes:

1. B. Latour, "When Things Strike Back: A Possible Contribution of Science Studies," in *The British Journal of Sociology* 51, no. 1 (2000): 107-123.
2. See S. Zizek, *The Sublime Object of Ideology* (London-New York: Verso, 1989); also P. Sloterdijk, *Kritik der zynischen Vernunft* (Frankfurt am Main: Suhrkamp, 1983).
3. See J. Habermas, "Technischer Fortschritt und soziale Lebenswelt," in *Technik und Wissenschaft als "Ideologie"* (Frankfurt am Main: Suhrkamp, 1968).
4. Quoted in R. Holmes, *The Age of Wonder: How the Romantic Generation Discovered the Beauty and Terror of Science* (London: Pantheon, 2008), 449.
5. *Ibid.*
6. See J. Ruskin, *Lectures of Art* (New York: Allworth, 1996).
7. See W. Kandinsky, "Farbkurs und Seminar," in *Staatliches Bauhaus Weimar 1919- 1923*, ed. Karl Nierendorf (Weimar und München: Bauhaus, 1923).
8. Boris Arvatov, "Utopia and Science," in *Lef*, no. 4 (1923): 16-21.
9. See for example, V. Vesna, "Toward a Third Culture: Being in Between" in *Leonardo* 34, no. 2, (2001): 121.
10. G. Youngblood, *Expanded Cinema* (New York: Dutton, 1970), 189.