Tafter Journal
Esperienze e strumenti per cultura e territorio

Nails, hammers and green rabbits. The challenge of art-science collaborative projects

I. Art, science, enterprise: the birth of Arscientia

Neuroscientist Steven Rose claims that an instrument, e.g. a scientific tool, shapes, and sometimes reduces, the world it depicts and our perception of it. Thus, when we hold a hammer, everything will appear more or less as a nail (Rose, 2005). The intuitive example of the hammer and the nails is extended by Rose to all those tools that are part of the daily routine of a scientist in the laboratory. Let us consider a complex technology coming from the biomedical field: magnetic resonance imaging (MRI) which allows scientists to generate images of the morphology and physiology of the body and brain. Inside the laboratory, MRI is used for research and diagnostic purposes: the images produced are taken as a proof of a condition of normality or deviation from a prescribed norm. However, what would happen if the same instrument were taken out of its original context and employed in an alternative way to its prescribed usage?

In the majority of cases, this might be the starting point of a project at the crossroad of art and science. Several more or less widely known artists have explored alternative uses of the MRI technology and its images. Thanks to MRI, some artists have been re-thinking their ways of doing sculpture (Marc Didou), others have used it to intertwine questions related to personal identity and the practice of portraiture (Justine Cooper, Angela Palmer, Suzanne Anker), others, eventually, have used the imagery created by brain imaging techniques to explore the correspondence between interior and exterior landscape (William Kentridge).

Today in the scientific field, technology plays an important role not only in the daily routine inside the laboratory but furthermore in the shaping of scientific theories, to the point where it is commons to speak of techno-science. The term techno-science was created back at the end of the ‘70s by the Belgian philosopher Gilbert Hottois; it was then explored further by sociologists of science such as Bruno Latour and by the feminist philospher Donna Haraway, author of the famous *Cyborg Manifest* (1985). In the past few years, different technologies have seemed to be converging: an example are nanotechnologies, a research program in which not only scientists from different disciplinary fields have been working together (chemists, physicians, biologists, engineers), but also scholars in the social sciences and humanities (philosophers, sociologists, bioethicists). Increasingly specialised scientific knowledge and technological innovations oblige human being to face challenges and, sometimes, even controversies around health, environment, economics, the human body, the relation with other people. To cope with these challenges science alone is not enough just as it is not enough the humanistic-artistic knowledge.

That is the cultural humus from which thrived the project Arscientia, a new format conceived by two Venetian companies, Picapao and Fondaco that aimed at cross-fertilizing art, science and appraise their innovative potential. Thanks to the final award and moments of dialogues on the newest tendencies and scenarios between art (specially applied arts) and science, young creative people were prompted to believe in their ideas and to learn how to turn them into sustainable business projects.

Arscientia developed through two different formulas: the Dialogues in Venice and the Events in several cities in the Northeast of Italy. The Dialogues created exchange opportunities with scientists, entrepreneurs, artists and designers both at the local and international level. The Events saw the

one-night opening of the local branches of Veneto Banca, main sponsor of Arscientia. Inside the bank, people could come with their own ideas or projects and take part in a business game designed to train them for the Arscientia competition.

II. Art-science relationship: a historical background

The existence of a relationship between art and science is neither surprising nor a unique feature of our contemporary age despite the scepticism of those who consider humanities and sciences two separate domains. Charles Percy Snow's 1959 Rede Lecture at the University of Cambridge articulated the difference between "The Two Cultures", restricting his talk to scientific as opposed to literary culture, without addressing the arts. He argued that the literary culture of his time was ignorant of science and quite proudly so. A few years later Snow talked optimistically – after the controversies in his first lecture – about a "third culture" which would foster dialogue between scientists and literary intellectuals.

Nowadays the expression "two cultures" implies science and the full panorama of arts, not simply literature. In order to fully grasp today's situation, it is worthwhile briefly recalling the historical relationship between art and science. From the nineteenth century onwards science and art have become autonomous. Before that time, art and science were not two separate and autonomous domains but two methods operating within the same system of knowledge. With the onset of the modern era, science coincided with philosophy of nature and both art and science pursued the study of man and nature (Pickstone 2000). Art itself was embedded in natural philosophy as, for example, theories and practices in anatomy clearly show. The dissections and descriptions of the human body that appear in the treatise *De humanis corporis fabrica* (1543) by Vesalius, a Flemish anatomist, contributed to the development of contemporary science of anatomy. Vesalius's wood engraved anatomical tables conjure up scientific precision, aesthetical values and allegorical tropes, becoming perhaps the first example of an art-science collaboration. In the Renaissance, artists such as Filippo Brunelleschi, Leonardo da Vinci, Leon Battista Alberti were systematically confronted with science and, more precisely, with a science of vision as testified by their use of perspective and vision machines.

It is only from the second half of the nineteenth century that art and science became two distinct forms of knowledge, organised in a hierarchical way. The Romantic conception of "l'art pour l'art" and the twenty-century period of the historical avanguardes has prompted the arts to pursue the search for originality and even radical independence. At the same time, however, it has kept them away from science, the only discipline with an epistemological primacy. Science, in fact, is asked to seek effective solutions to the most urgent questions and challenges of our time. Art, despite its being necessary as cultural activity and capable of anticipating socio-political changes, has a marginal role. Art offers merely suggestions, not solutions to questions that only techno-science seems capable to address: the explanation of physical phenomena, the functioning of the brain and so forth.

Since the 1990s, there has been a proliferation of science-art exhibitions and festivals drawing the attention of the public to the cross-fertilisation between techno-science and art and to the artefacts produced within artist-in-the-lab projects. In the UK, the National Endowment for Science, Technology and the Arts (NESTA) was created in 1998, the sci-art consortium the following year. The 2001 report '*Imagination and Understanding*' published by the Council of Science and Technology (CST) further fosters the development of collaborations between scientists and artists. The report points out that divisions between arts, sciences and education are considered a cause of deceleration of the economy, therefore, a scheme which supports the creation of innovative outcomes from collaborative projects among artists, scientists and universities is felt necessary.

III. Artists in the lab

Hence, this new category of artists, defined “artists in the lab”, was born. Artists collaborate with scientists for a variety of reasons that here can only be briefly mentioned. First of all, to enter a scientist’s laboratory is often the only way to get access to cutting-edge instruments and images otherwise not easily available. Given the increasingly important role played by images in scientists’ daily job, it is common to talk of a “visual turn” in science since the 1990s.

Art historian James Elkins, one of the first to become interested in the relationship between art and science, argues that nowadays the most interesting images are created by scientists rather than by artists as testified, for example, by the images obtained through atomic force microscopes in nanotechnologies. Second, works born from an artist-scientist collaboration can develop not only a better public understanding of science, but also a critical reflection upon the societal implications of scientific research. Third, one of the plausible reasons for the popularity of these partnerships is the sense of frailty of the individual facing the challenges and complexities of our technically-driven world. The understanding of complex phenomena and the attempt to make sense of the chaotic stimuli that overwhelm us is somehow made easier. On the one hand, in the aseptic laboratory, the attention focused on single details, the scientific way of proceeding by hypothesis and assumptions to be tested through well defined experiments, might reduce the artistic tension born of confronting the complexity of the world. On the other hand, collaborating with an artist might help the scientist explore hybrid methods and even challenge the experimental system itself.

An ‘experimental system’ is a closed and well-defined system, apt for simplifying the complexity of the phenomenon to be analysed, but, at the same time, it must always rely on the epistemic horizon of other systems and landscapes that might redefine the experimental object and, consequently, the ‘experimental system’ involving it (Rheinberger, 1997). Departing from the reduction of complexity, an ‘experimental system’ might face the re-presentation of complexity after fragmentation. This new complexity might pose questions and problems not only for the analysis and interpretation of the experiment in question but even for future scenarios. However, the cross-fertilisation of science by artistic procedures might help lay bare and challenge the assumptions followed when preparing and interpreting an experiment.

It is worh mentioning that many of the professionals involved in art-science collaborative projects highlight that art and science still are (and should remain) distinct activities: “to suggest that art and science are related might be dangerous. Surely scientific images can be beautiful and even artistic, but they are not art, and art is not science”. This is the view of the scientific photographer Felice Frankel, whose images rich in details, almost tactile, have conquered the covers of many prestigious scientific journals among which *Nature* and *Scientific American*.

Being ready to support art-science collaborative projects does not mean, however, wipe out the peculiar methods and features of each discipline. It rather means to be open to the potential results of those collaboration, outputs that cannot be easily categorized as art nor as science, being truly hybrids. The *Science Gallery* of the Trinity College in Dublin, funded and directed by Michael John Gorman as well as *Le Laboratoire* in Paris, funded in 2007 by David Edwards in collaboration with Harvard University, are two excellences in the field of the cross-fertilization among art, science and, sometimes, even enterprise. Those are places of cultural experimentation where professionals in different fields work closely together to create finite exhibitions, products and projects. Some products have been patented, this is the case of *Le Whif*, defined by Edwards as “a new and delicious approach to food, an aereosol-whistle to taste food through inhalation”.

Other renown examples of hybrid processes and products are those coming from research in genomics, a field where artists can work with living tissues and materials. In 2000 Brasilian artist Eduardo Kac creates GFP Bunny, a rabbit with a jellyfish gene that becomes green when exposed to a certain type of light. GFP Bunny is one of the first examples of transgenic art that is “the creation of an organic living being, completely artificial, for artistic purposes” (P. L. 5 Capucci).
Kac’s green rabbit is only one of the several creations made in the field of BioArt. Namely, centres specialised in art and biotechnologies are growing fast: SymbioticA, for example, funded by Oron Catts and Ionat Zurr at University of Western Australia, operates within the faculties of anatomy and human biology, and it organises centres and residencies for artists, scientists and philosophers.

The importance of fostering collaboration among professionals from different fields is highlighted by Paola Antonelli, senior curator at the department of Architecture and Design at MoMa in New York and curator of the 2008 exhibition *Design and the Elastic Mind*: “the majority of biodesigners does not correspond to the image of the mad scientist who, emulating God, is concerned with the creation of a new being: some work with visible organisms such as plants and animals, some with bacterial and cells, others work on the creation of new living systems through DNA manipulation. None of them, however, work alone in a ‘no man’s land’ of ethics, they all prefer to work in team composed of physicians, mathematicians, computer informatics, engineers, scholars in bioethics, sometimes even experts in economics and philosophers”.
The collective SymbioticA supports and hosts, among others, *Tissue Culture*, an artistic project on the use of organic tissue technologies as an artistic means apt for improving life quality. In order to describe their tools, Catts and Zurr coined the term “semi-living”. If things surrounding us were, simoultaneously, living entities, “we would start to have a more responsible attitude towards the environment, and to hold down our disruptive consumerist behaviour”.

That said, a number of contemporary experiments growing out of art-science collaboration do not really influence or leave a trace on the artist’s or the scientist’s practice. Too often such collaboration does not evolve into autonomous and vital experiences – whether artistic or scientific – disjointed from commercial and scientific outputs or, if they do, those results are not easy to track down beyond temporary exhibitions or symposia (Dorfles, 2001).

IV. The ‘attached observer’
In order to grasp the possible reciprocal synergies between the artist’s and the scientist’s practices, those collaborations should be discussed and analysed in their unfolding as well as in the traces they leave in the everyday activity of the scientist and of the artist. The ‘attached observer’ – a methodological stance taken from the ethnographic field – is an attempt to understand the process rather than only the outputs of these collaborative projects. The introduction of a third agent beyond the artist and the scientist has the merit of focusing attention on the forms of the collaboration itself not only retrospectively, as often happened in papers and articles written after the collaborative project had already ended, but while the project unfolds within the laboratory (Leach, 2006: 447-451). Consequently, the key words are *process* – not output – and *interaction* between the people involved. The attached observer acts as an observer and sometimes even as a participant within the project, triggering questions, facilitating and questioning the interaction itself, exploring possibilities that might show new directions of research for the artist and the scientist individually, even after the specific collaboration has ended (Mandelbrojt, 1994). As social anthropologist James Leach puts it: ‘those new directions, perhaps more than any finished physical output, are a genuinely collaborative product, unimaginable without the particular relationships between those involved’ (2006: 449).

V. Art and Science: the New Challenges

The debate among readers and authors of *Leonardo – The Journal of Art, Science and Technology* and of the SEAD group (Network for Sciences, Engineering, Arts and Design) concerns the challenges now facing those willing to explore the field in-between art and science, either from a scholarly perspective or as practitioners. Following there are some of the most urgent challenges, rigorously randomly listed:
1. The evaluation of the art-science projects. When can we establish whether a collaborative project is less or more successful? Is it always recommendable to have a final result, a finished product or is it better to focus on the process, on the on-going collaboration? The challenge here is the necessity to evaluate art-science collaboration without framing them into rigid protocols, on the contrary maintaining a high degree of creative freedom.
2. An afterthought of the educational system as a whole. The pedagogical and educational innovation is concerned with the interdisciplinary teaching and the various learning methods. In Italy, for example, since the Gentile Reform in 1932 the separation between humanities and sciences prevails in the learning objectives and outcomes set for the compulsory education and for higher education at university level. Besides a few trans-disciplinary doctoral programs, the competitive exams for university level employment are organised and issued according to rigid disciplinary sectors.
3. The role of enterprise in art-science projects in a time of a deep socio-economical crisis. Does a private company have to play a role of mere facilitator and supporter of those projects (mainly through sponsorship) or is it possible to re-think of the workable ways of doing business thanks to collaborative art-science initiatives?
4. Intellectual property and author copyright. Science, engineering, art, design, music have developed very different approaches to cope with the issue of intellectual property, patenting, protecting copyright. Often, such diverse approaches might obstacle information sharing. One of the most controversial issues concerns the intellectual property for possible commercial applications and for establishing criteria to promote (or not) individual career pathways within research organizations and institutions.

Leaving to the readers the task of facing those big and small challenges, let us go back to Rose's claim that opened up this article: if we have a hammer, everything will appear more or less as a nail. While the artistic use of a scientific instrument is not *per se* capable of maintaining the complexity of the phenomenon under investigation, nevertheless, some artists' practices, regardless of their taking place inside a scientific laboratory, might be a possible means to keep the hammer in the hand without reducing the world to a nail.

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