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Comment

The science and society movement and the MUSE project

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> *"The Muse Project is an invitation to dialogue between nature, science and society."* (From the Cultural Plan Vision Declaration. Joint drawing up)

For the purpose of this article, Science & Society (S&S) is referred to as that current of thoughts and those cultural initiatives aimed at fostering dialogue between research, scientific and technical output on the one hand and society on the other, so as to allow people to make conscious decisions about science and the sustainability of its developments. This concept underlies the elaboration of the MUSE cultural concept, the new Science Museum in Trent, Northern Italy.

Within the S&S framework, a new, independent approach has been adopted to spread scientific culture in the face of the many doubts arisen about science and its developments. This doubtful attitude is relatively recent and can be traced back to the rise of the environmental movement in the early 60s, when the then emerging (technological) growth and social improvement models were criticised, especially in terms of equivalence between (technological) progress and social improvement. The opposition to progress at all costs – stemming from an anarchic approach typical of the new age period – has laid the foundations for most criticism in the following years, thus generating ideas of moderation in the use of resources, limits to development and sustainability, which all became part of the line of thought pertaining to the S&S.

Together with environmental and techno-scientific ones, other issues relating to molecular biological technologies, nanotechnologies and decision-making processes in the energy sector (starting from anti-nuclear and pacifist debates) came into play. These elements all belong to the so called "Unfinished Sciences[1]", i.e. those scientific sectors challenging – in their experimental and production stages – ethical limits or the ideas of development limitation and sustainability.

As far as techno sciences are concerned, Pietro Greco highlighted a different and important aspect in the relation between science and society.[2] The author quite rightly pointed out that scientific research has become more and more application-oriented over the 20th century, thus leading validation of research results to a progressive passage from the academic world to market. Divergences between production and consumption have thus arisen: on the one hand there is supply in terms of research, development and marketing of innovation-oriented scientific and technological products; on the other hand there is demand, i.e. people, who can determine the success or failure of a "product". In other words, they can accept or reject social products and models suggested by academic, economic, political and media pressure groups.[3] As a consequence, the author has elaborated a network-like model to better understand present relations between science and society, where citizens actively participate in the information exchange between scientific research and its applications.

Furthermore, Europe is now experiencing a critical period in the relation between citizens and scientific culture. On the one hand, decision-makers have prefigured the creation of a competitive and united knowledge-based society that would lead to a remarkable growth in the production of ideas related to technical and scientific patentability across the EU.[4] On the other hand, human resources working in the scientific sector and the number of young people undertaking scientific or technological studies at university are undergoing a progressive and relentless decrease.

Actions have been taken for communication methods to be developed which can help understand science. Their main goal is to overcome – through knowledge – the apodictical or ideological rejection of scientific progress and its applications, as well as encourage young people to work in the scientific field.

For this reason, efforts have been made within the S&S framework in order to change social, economic and educational elements referable to people's limited comprehension of scientific developments, mounting criticism of social models having technological progress as their main driving force, remarkable loss of interest on the part of young generations in the science-technology couple as a value to which devote their future.

The method adopted in the S&S initiative first of all envisaged rejection of past authoritative educational models based on knowledge transfer. Criticism of vertical knowledge transfer downwards, i.e. from experts to individuals passively absorbing information, was better defined in the S&S critical analysis of the *Public Understanding of Science* movement (PUS) and its *Deficit Model*. With this in mind, it is worth recalling that PUS, in the late 80s, created the appropriate framework for an in-depth analysis of the need for improving scientific knowledge, based on the idea that it would automatically lead to a positive attitude of people towards science and its applications. This concept, however, later proved to be incomplete.

In the light of events, the goals set by the PUS movement were not achieved, perhaps for the very simple reason that there are as many sciences as there are problems relating to their application. Therefore, the impossibility clearly appeared of reaching an average literacy level generating appropriate conditions for people to evaluate each situation and problem consciously and with sufficient knowledge of facts. After realising this, the certainty arose within the S&S framework that the creation of a society able to make relevant and conscious decisions – rather than one based on the accumulation of knowledge – would facilitate the development of methodological competences leading to (rational and critical) thinking in each and every situation. Hence the decision to respect a more and more critical approach of society in the face of the chances offered by technoscience. An experimental, yet democratic and participative way to communicate with people was then started whereby knowledge-building activities and common judgements took place within the context of dialogue and debate.

New working tools and methods were then developed which lead cultural actions not to be focused on scientific problems or issues (object), but on citizens (subject), who – through their knowledge and (mis)conceptions – are at the very heart of their opinion falsification and opinion building process. Participative tools typically belong to debate, focus groups and dialogue with experts. A good example of extensive application of this model in Italy is Agenda 21, which involved whole communities supported by their respective administrations.[5]

The actors of dialogue, or better, those encouraging it, are usually researchers working in the same sector being discussed and subject to mediation,[6] or working in the sectors of sociology and philosophy of science, where S&S is considered as a specific field of study. Other protagonists in the S&S framework are, on the one hand, scientific journalists, school and university teachers and, on the other hand, citizens and their spontaneous and organized movements.

Science museums and science centres are two particular types of actors in the S&S framework. Museums are conceived as places for collection, study and preservation, while their educational role was only gradually acknowledged over the last century, having PUS as a strong ally. Also research in science museums mirrors the changes that took place in the realm of research. Take museums of natural history as an example: the environmental movement saw the participation of the most innovative museums, so that – together with the traditional task of collecting and describing – interpreting and prefiguring were added. A similar approach may be identified in the case of science centres. From a purely didactical activity around the basics of scientific disciplines – typically realised through interactive devices (*exhibit hands-on*), used as particularly effective tools to bring about informal involvement and learning – a change was made to consider scientific disciplines in all their aspects, including ethical ones, which are strongly related to contemporary reality and problems. Permanent and temporary exhibitions about energy, genetics, biotechnologies and climate changes are only some specific examples of how the pedagogical approach exclusively limited to basic disciplines can be overcome.

Science museums and science centres have therefore set out to analyse in detail the S&S approach and the new proposals, both from a museological and a cultural mediation point of view. In particular, the use of museum areas specifically devoted to the exchange among experts (of either the museum or guests) and visitors, or where mediation between researchers and visitors takes place in remote areas – such as research centres and hospitals – by means of technological devices is worth mentioning[7]. Role plays were

experimented aiming at a full participation of visitors in opinion-building activities, where the contribution of experts was limited to providing basic scientific "facts" related to the subject under discussion. In other cases, such as in scientific theatres, a sensitivity-oriented and emotional approach was adopted in order to generate questions that visitors would be able to answer while visiting the museum or in their own cultural development. These and other newly adopted approaches are now being experimented: open-door laboratories, nights at the museum, scientific cafes, scientific exhibits in the streets and "Science in the Street" events are all examples of an increasing number of initiatives open to influences from other fields (literature, philosophy, arts etc.) and that are undoubtedly a new frontier for contemporary scientific museology.

A closer look, however, clearly reveals a weak spot worth mentioning: most initiatives can be organised in contexts other than museums or science centres. However, what can be considered as a weak point for the implementation of the new S&S concepts in museums, can in fact be far compensated if considered in relation to the immaterial value of the location and the brand value of what can be seen at the museum. As for the former aspect, the term *immersivity* does not only refer to the full multi-sensorial involvement of visitors by means of a new, multimedia technological device, but includes space and time dimensions connected with experiences in the museum. Just like any other location (stadiums, theatres, concert halls, churches) the principles of emotional experience in first person, the sense of belonging to a group sharing the museum experience and the emotion arising from the experience itself – in relation to its participative aspect and feeling of being protagonists (we chose, I said, I did etc.) – also apply to museums. Following this principle, the physical space of museums or science centres can play an important role as urban and cultural *Locations* specifically devoted to science and scientific debates, where visitors can have a multi-sensorial experience going from observation to interactivity, from reasoning to dialogue. The latter aspect, relating to *brand*, highlights the role of museums as cultural actors in terms of relevance, fame, reliability. Museums can thus be recognized by their *Logo*, irrespective of where events are organised, be it in streets, squares, cafes, industrial plants etc.

Over the past few years, the cultural action of the *Museo Tridentino di Scienze Naturali* (MTSN), the Tridentine Museum of Natural Sciences, has been following the principles outlined above, which have lead to the drawing up of the *Muse* project, the MUseum of SciencE, due to be inaugurated in 2010 within the context of Trent's urban upgrading ,with the contribution of architect Renzo Piano.

The analysis of the S&S movement has gradually become part of the mission of the Tridentine Museum of Natural Sciences. It has moved in parallel with the creation and spread of activities addressed to people who, over the last fifteen years, have turned museums from an exhibition to a place of interpretation[8]. The approach and success of these initiatives have lead to the proposal for a new, larger, and conceptually more open venue for science-based cultural activities. Both public and political support to the *Muse* project originate from the awareness that museums can effectively promote scientific culture and play a specific "social role", as they are closely connected with local communities by offering chances to meet and socialise with others and foster dialogue and discussion on current affairs.

The Muse Cultural Project[9] stemmed from the realization that in contemporary society – and especially in Trent – some strategic investments are to be considered:

- protection of the environment as a universal value necessary to improve the quality of life of citizens and as an unavoidable element providing quality supply to the tourist sector;
- scientific and technological innovation within the new global settings of territorial location.

The creation of a science centre as a museum devoted to scientific culture can therefore be considered as part of a policy geared towards the creation of knowledge, awareness and dissemination of information about the objectives of environment protection, environment quality, scientific and technological innovation under the following terms:

- awareness of the natural heritage and ethical commitment involved in preserving nature and the environment;
- understanding of the relation existing between local and global dimensions, starting from environmental factors;
- encouragement of an informal, playful, participative, interactive "first person" approach with science and its technological applications;
- awareness-raising about the contribution technical and scientific culture can give to contemporary societies;
- understanding of the connection between science and technology, together with the ethical commitment of contemporary societies;

- encouragement to apply scientific methods in every day's life;
- promotion of studies and jobs in scientific research.

As it clearly appears, together with the traditional functions of preservation, exhibition and education, there are debate on current affairs, encouragement of social participation, updated information on career opportunities in the scientific field. The typical S&S approach involves:

- use of scientific knowledge to present nature and highlight its connections with society, thus encouraging visitors to take part in debates;
- analysis of choices, methods and technologies through which society can promote sustainable development;
- create the appropriate framework for visitors to understand the connection existing between nature, science and society through a tailor-made programme including learning, playing and thinking.

Within the S&S framework, the Muse Project will develop around the interrelation between three major philosophical clusters: nature and the environment, science and technology, society. Visitor/s learning, playing, talking and thinking are at their core.

The present work does not include the description of subjects that will be developed in museums within the framework of the Muse Project. However, Muse will have a typically *glocal* nature and will develop around two main concepts: protection of nature, with particular attention to *local* Alps, and scientific and innovation culture, necessarily related and open to *global* thinking.

The activity of the working group involved in drawing up the Muse Cultural Project resulted in the following slogan:

We want to interpret nature	NATURE
starting from our mountains	LOCAL
using our eyes, scientific tools and questions	SCIENCE
to seize today's challenges	GLOBAL
and encourage visitors to talk,	SOCIETY
so that science, innovation and sustainability are enhanced.	**MUSE**

Translated by Silvia Agostini

Notes and references

[1] Definition by John Durant in: "Creating Connections" Altamira Press (2004).
[2] The Model of Venice. Communication in the scientific post academic age. http://physics.units.it/didattica/aa2003/programmi.
[3] These divergences can be best expressed in and are a topical subject of philosophy and philosophy of science, encouraging public opinion to participate in scientific debates, as highlighted by Umberto Galimberti in "*Psiche e teche. L'uomo nell'età delle macchine*" Feltrinelli (1999). His philosophy/line of thought and the conferences he has held in Italy are a real media phenomenon of remarkable proportions.
[4] In march 2000, the Lisbon European Council adopted a strategic objective for Europe to become: "*the most competitive and dynamic knowledge-based economy capable of sustainable economic growth with more and better jobs and greater social cohesion*" by 2010. The evident underestimation of the globalization process in a knowledge-based society – and especially of the role the new EU member states can play – as well as the difficulty in achieving the objectives set in Lisbon, make it clear that a review of the Lisbon Declaration is necessary.
[5] For a good overview of good practices see: F. Pulselli et al., *La soglia della sostenibilità, ovvero quello che il Pil non dice*. Donzelli, 2007.
[6] In this case, also the presence of a third party as mediator may be subject to critcism or attention due to possible conflicts of interest on the part of researchers, who apparently belong – at least potentially – to the advocates of scientistic models and styles.
[7] The most well-known examples are the Exploratorium in San Francisco, the Natural History Museum and the Science Museum in London.
[8] www.mtsn.tn.it The museum website includes past and present initiatives.
[9] The Muse Cultural Project is the result of a joint elaboration involving more than 50 people in 2005 <http://www.mtsn.tn.it>.

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