



# Art and Science: Parallel Yet Converging Realities. The Importance of Technology in the Preservation of Art

There is prevalent preconception of a strong dichotomy between Science and Art. But if we take a closer look, there is no reason why this duality should exist. Actually, there has always been an interdependent relationship between Art and Science, but as of today, this tie has changed, because a part of what is commonly called science is in reality a technological application. Indeed, contemporary culture is not a culture of “ars” and of “scientia” (separate worlds), but rather a “techno-culture”, a hybrid in which diversity does not prevail over identity. But there is an area in which the convergence of these two apparently opposite worlds occurs, and this is the preservation and restoration of works of art. And this is where ‘techno-culture’ as well comes to the rescue of Art; in fact, positive results have been attained thanks to the collaboration between experts in physics, geologists, IT specialists, art historians, biologists, chemists, archaeologists, and restorers drawn together by the mutual intent to understand, safeguard, and conserve significant testimony of our Civilisation

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What is the relationship between Art and Science? Can it be hypothesized that we are dealing with two opposite entities: the intuitivism of art – a product of human irrationality – on the one hand, and the positive structure confirmed by scientific knowledge on the other? Yet, is it actually correct to judge a work of art as a product of human irrationality, the result of impulsive emotionality, lacking in rules and canons? Whilst would science (scientia) – as its opposite – be

the result of an unerring rationalism, the sum of widely verified procedures, the search for a univocal, certain, and indisputable truth?

There is a common preconception of a profound diarchy between Science and Art. Many believe Art to be nobler, just as many others think that science is something characterized by ‘hybris’, by a sort of superb tendency to abuse its power over other realms of knowledge. But if we look more closely, this is not the case: in science there are profound values that are important for all of society. The fundamental instrument of science is, in fact, the scientific method, which drives mechanisms of verification and confutation unique to our culture. It is an artificial method, constructed by

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man but effective precisely because it eliminates many of the dogmatic components that may flaw our way of reasoning. Science convinces us to accept a lifetime method comprising a fundamental intellectual honesty, to accept the fact that what happens in the world can always prove our hypotheses to be wrong, or urge us into taking steps forward in order to learn from our mistakes. Fakes are rampant, and in no other field are truths – with a lower-case t – discovered and even confuted so quickly as in science. Moreover, the vision of science as something algid, boastfully exact and enlightening, has contributed to distancing two cultural sectors, and worse, to confining science to a sort of ghetto, reducing it to an “ugly subject”, or even a mere utilitarian instrument.

But it can also be said that art, like science, must construct both a visible and an invisible at-las, because according to Francis Bacon, there is a need for “...a realism that is the result of true invention, of a truly new way of capturing reality in something arbitrary.” Thus, having arrived so far, art clashes with reality in exactly the same way science does. And Art and Science discover almost contemporaneously that this specific reality is much more elusive and complicated than it had ever been imagined before. Indeed, as is well known, the Greeks always paid the utmost attention to attaining aesthetics, attempting to find a supreme degree of harmony and formal perfection in every form of artistic expression. The main characteristics that distinguished their production from that of other ancient civilizations were their relentless attention and fidelity to realism. Indeed in sculpture, this translated into a detailed observation of the human anatomy; in painting instead it was expressed in their striving to represent a perspective of space and a conveyance of volumes, whereas in architecture, the close correspondence between form and function was the direct consequence of a rational approach to their comprehension and knowledge of the world.

In turn, the creation of a work of art in the XV and XVI centuries was a complex and articulate expression of science and artistic skill, where the choice of objects, measurements, proportions, and perspective were carefully calculated according to precise “canons”, with the rules established by the artist and/or the

discipline itself. Truthfully, this portrayal of the existing antinomic relationship between Art and Science is inexact, above all if one glances toward the past (for example, during the Italian Renaissance, Leon Battista Alberti, Piero della Francesca, Luca Pacioli, as well as Leonardo da Vinci, were not only artists, but also eminent scientists and mathematicians).

But the philosophical antinomies produced in comparing Art with Science are poorly suited to a contemporary comparison. Indeed, as was mentioned above, the relationship between Art and Science has always been quite close, but nowadays, this connection has also changed, in that a part of what is commonly called science is in reality a technological application. Indeed, contemporary culture is not a culture of “ars” and of “scientia” (separate worlds), but rather a “technoculture”, a hybrid in which diversity does not prevail over identity. Furthermore, we can no longer dub it a so-called “western culture”, given that today both Art and Science are universal values, recognized in every corner of the globe, objectives pursued in all nations and all cultures, characteristic of the global and simultaneous knowledge of the XXI century, conveyed and diffused by means of telematic networks. Therefore, these are not “opposite” factions, considered in a dialectical vision (a conception that today seems obsolete), but rather complementary and overlapping aspects of present and future civilizations, functions by now deeply-rooted in the social and universal being.

Moreover, there is an area where the convergence of these two apparently opposite entities occurs, and would be in the preservation and restoration of works of art. In fact, it is in the highly specific sector that activities and studies happen to converge, in the mutual intent to acquire ‘knowledge’. Knowledge, intended as an ‘unveiling’ of the work of art, of the material from which it is made, of its ties with the environment that surrounded it then and does now, and what actions must be taken to thwart the inevitable decay of the tangible substances it is made of. Knowledge as a field where it is necessary to channel a wide variety of skills that – although they may start from different viewpoints, use distinct methodological circuits, and follow parallel paths – in the end pursue an objective that is one and



**FIGURE 1** Decoration on the inside of the podanipter from the so-called Marbles of the Ascoli Satriano complex  
 Source: *I Marmi dipinti di Ascoli Satriano, catalogue of the exhibition* edited by A. Bottini, E. Setari, Milan 2009, p. 45

the same; in other words and more specifically, that of understanding the mechanisms that regulate the behavior of the material from which the work is made and the impact of the environment on it. Hence one investigates the “flesh”, the “life”, and the “world” of a work of art, beginning with different viewpoints, but with the intention of knowing it intimately (to the point of perceiving its quasi spiritual essence) and moved by the desire to find systems aimed at contrasting aggressive and pathogenic factors; these, in fact – as occurs for man – can harm the artistic testimony to the point of bringing it to its final stage of “life”, or “death” (of the matter itself). But this research plan, targeted at attaining the knowledge necessary to pursue the common objectives of safeguarding works of art, requires a convergence of synergetic skills, that are also sustained by the latest in technological innovations. Hence, experts in various fields necessarily join their efforts: physicists, geologists, IT specialists, art historians, biologists,

chemists, archaeologists, and restorers – all with the mutual intent to know, safeguard, and conserve significant testimony of art and culture.

It is this spirit that, over past decades, has been the driving force of a close and profitable collaboration between ENEA (the Italian National Agency for New Technologies, Energy and Sustainable Economic Development) and the Ministry of Cultural Resources and Activities. Such a collaboration has resulted in important works being studied, investigated, and analyzed by various specialists of two different bodies, with the intent of understanding them better in order to safeguard and preserve them for future generations. This has given rise to the creation of ‘task forces’ that, regarding the Soprintendenza Archeologica di Roma, (now the Soprintendenza Speciale per i Beni Archeologici di Roma), have studied specific and significant works, like the bronze statues of the ‘Boxer of Quirinal’, and the so-called ‘Hellenistic Prince’, the marble ‘Lancelotti Discobolus’, the earthenware complex of Ariccia; the frescoes in the Colombarium of Villa Pamphilj, the obelisk in Piazza San Giovanni in Laterano, and more, confirming the need for these collaborations also through specialistic publications.

More recently, and precisely in the year 2009, the Soprintendenza Speciale per i Beni Archeologici di Roma – together with other bodies, including a fundamental contribution by ENEA – dealt with the study, research, and conservative intervention applied to the so-called marbles of Ascoli Satriano, a stunning complex of sculptures dating back to the IV century B.C.– bearing unusual and highly sophisticated polychrome decorations as well as gold leaf ornaments (the latter have been lost, but their undeniable traces still do exist).

The intense and worthwhile work of the team was conducted the day after their restitution – requested and obtained – from a foreign museum, which had illegally acquired these inestimable archaeological artifacts, as a fruit of clandestine excavations that took place in the Apulian territory (in the ancient Magna Graecia). This above-mentioned, extraordinary collection of marbles – some exceptionally painted and undoubtedly of Greek origins - enables us to understand how serious the loss of archaeological data caused by clandestine



**FIGURE 2** The two ideograms, or morphemes, that explicate the word 'crisis'

excavations is; data that were recovered, albeit only minimally, through targeted studies, comparisons, and investigations, some of which were scientific-analytic. Yet, beyond 'knowledge', 'research' – aimed at safeguarding, preserving, and restoring our enormous artistic heritage – is the new frontier, the most cogent objective that today has become a top priority in the world of Cultural Resources. Research must make use of experts – whether with a more 'humanistic' and/or 'scientific-technological preparation' – who, beginning by the knowledge of the work intended as testimony of the past, as well as the material from which it is made, are capable of interpreting and discovering the inter-relationships among the results of the investigations conducted. This in function of the restoration and conservation of our cultural Heritage, even publishing both the results and the scientific principles underlying each field of expertise.

Research, therefore, considered as the fundamental moment at the base of every work; research that necessarily underlies any activity, especially those benefitting from the latest technological innovations; research that – precisely in these most recent years and due to the economic crisis that has swept over so many Countries, including Italy – has seen a notable decrease in the distribution of financing. Article 9 of

the Italian Constitutions says: "The Republic promotes the development of culture and scientific and technical research". This dictate of our Constitution would oblige our government to make strategic and long-term choices in this sector, to invest in Research, Education, Universities, and Cultural Resources, to sustain the young people who decide to dedicate their own lives to Science, and especially the group that is at 'the service' of Art. Yet, it is common knowledge that Italy invests little and badly in research, in her huge cultural heritage and, consequently in her human capital, which is an inseparable condition. But what consequences will this have for Italy? If this trend is not successfully inverted in the long term and by looking toward the future, there is a risk of marginalization or, worse yet, the progressive loss of national sovereignty. Science, as has been seen, is above all knowledge, or 'unveiling' and if knowledge is developed and detained only by some countries, the inability to participate in this unveiling process, of bringing knowledge it-self into the light, inexorably compromises the active, conscious and aware presence of Italy, even in choices concerning the conservation of our immense historical-artistic heritage. So, to this view, what consequences is the permanence of this negative economic-financial situation now causing and eventually giving rise to in the world of research, activities, and studies directly connected to Cultural Resources?

In the Chinese language, the word 'crisis' consists of two ideograms, or morphemes, which mean 'risk' and 'opportunity' (Fig. 2). Indeed, every crisis is at once risk and an opportunity for recovery, regeneration on different principles, on different assumptions. Therefore, hopefully a crisis – this crisis – can be turned into an opportunity for growth, favouring – for example and more specifically – those initiatives for study, conservation, restoration, and improvement aimed at the field of Cultural Resources. Such great opportunity must begin precisely by relaunching the research sector. Only in this way can there be a future for both Science and Art (... that Italy has so much of).