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Historical Heritage and Future Creativity

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1. Introduction

A series of technological developments are radically transforming what is possible in the realm of new media. We are told that Telecommunications, Broadcast and Internet, which were perceived as separate networks will converge into a single network within the next decade. [1] Developments in miniaturization in the direction of nanotechnology mean that electronic devices, which once consumed much space will "disappear" from sight and become part of ambient intelligence. [2] As a result walls, windows and other surfaces can function as computer screens and interaction devices. A report from the BBC News (12 January 2000) indicated that "1 gramme of dried DNA can hold as much information as 1 trillion CDs." Once this becomes a reality then we can almost literally have the whole world in our hands as far as replicas of culture go. Whether we have a small portable screen or large fixed projection plane will largely be a question of functional need and convenience.

Parallel with this there has been a dramatic increase in collaborative technologies. For instance, the Search for Extraterrestrial Intelligence (SETI) project makes use of volunteers' computers while their screen savers are on: i.e. using their idle capacity. On 30 July 2000 there were 2,192,077 such volunteers entailed 11.17 trillion instructions (or teraflops) per second. By 28 April 2003 there were 4,454, 985 volunteers whose computers entailed 32.60 teraflops. This equals 50% of the combined power of the 500 top computers two years ago. There are now more than 660 million everyday users of computers. If all of these were linked for collaborative work, their spare capacity would entail approximately 4,620 teraflops a second. If the power of computers and the number of users continues to rise apace then the potentials are enormous.

This paper reviews some recent developments and explores some implications and potentials of these new technologies specifically with respect to creativity. There are trends towards contextualization, objects that describe themselves, alternative interpretations and world-views. It is suggested that the challenges of finding new ways of visual as well as verbal quoting and new ways of combining universal and particular offer new roads for creativity.

2. Contextualisation of Space and Time

Traditionally treatments of spatial forms have been the domain of those in Geographical Information Systems (GIS). Those concerned with reconstructions of buildings were concerned with architectural software such as Auto-CAD, while those concerned with individual objects frequently used specialized scanning devices –e.g. the Canadian NRC laser scanner now licensed by Arius 3-D.

Already in 1994 Art+Com's TerraVision (T-Vision) project[3] demonstrated a vision whereby one could move from a satellite image of the earth, zoom down to a city, enter into a reconstruction of a physical building and then focus on an object in that building. This idea was subsequently taken up under the same name by SRI international with major funding from the military resulting in the Digital Earth project.[4]

The past decade has seen enormous strides with respect to systems such as MapQuest, which link maps around the world, to navigation systems for automobiles and yet a systematic integration of geo-spatial information whereby we can move seamlessly from satellite images to real images on the street is still the subject of spy and thriller films rather than everyday reality.

With respect to the historical centre of Bologna, the Nuovo Museo Elettronico (NUME)[5] project has shown how a mastery of a specific space could also be treated temporally such that one can trace the evolution of a city from the year 1000 to the present. If applied systematically such an approach would open enormous possibilities with respect to our abilities to access information.

One scenario: Theoretically one could have a cell phone with an I-Mode camera or European UMTS equivalent which could determine where one is and then provide one with historical views of that place.[6]

Another scenario: One goes around with one's telephone-camera- recording device finding spots of interest, then returns to one's hotel or place of study and explores the historical dimensions.

A third scenario: One uses the web cams of major cities to identify such spots of interest before one begins one's holiday, does one's homework and thus has an infinitely richer tourist experience.

A more futuristic scenario: We have enormous knowledge of the physical world in our encyclopaedias and more generally in our memory institutions. Our pattern recognition techniques are sufficiently advanced to recognize classes of objects and even individual faces. Telephone companies and James Bond films already discuss the scenario whereby we point our phone-camera at a person, the image is sent to a database and the name of the person standing before us is identified.

Through the concept of virtual reference rooms this principle could be applied generally. I am walking in a field or forest and see an unknown plant. My phone-camera photographs the image, sends it via Internet to a database and identifies the plant. In this way even objects without implants can become self-describing (cf. below). The coupling of cumulative knowledge via mobile networks means that everything can potentially identify itself.

Implicit in such scenarios is a fundamental shift in the nature of tourism, all visiting of places and indeed in the very nature of what it means to know or not know. In the 19th century one had one's Baedeker, Guide Bleu or equivalent and typically had a single, quick description of any major monument one encountered. One's guide-book provided only a verbal description of what one saw and there was no way of recording one's own impression prior to the days of handy portable cameras. The new contextualization of spatio-temporal knowledge means that one can potentially have access to all extant knowledge about any place at any time, linking one's personal impressions with formal ones and having access to multiple interpretations (see below).

One paradox in all this is that although the technological challenges are theoretically solved and although there are concrete examples to demonstrate the potentials, many academics are still wary of these advances for psychological reasons, such that the time needed to achieve what could seem obvious is more likely to be decades rather than a few years. A full implementation of the process that has begun will entail an integration of categories such as telephone-cameras, web-cams, maps, tourist guides, encyclopaedias, into a single system. If one can combine the existing and one's own this will transform also the range and meaning of photo albums and home movies. Such new combinations will be one new avenue for creativity.

3. Self-Describing Cultural Objects

Ambient intelligence means that every object of culture can eventually have its own computer, its own electronic devices that help to describe its own history.[7] Even before ambient intelligence, this new link between object and description has been emerging. In 1991 when the Institut National de L'Audiovisuel and IBM worked together on a reconstruction of the famous Abbey of Cluny, which was destroyed during the French Revolution. The reconstruction has an electronic guide in the form of a monk who can take one on virtual tours. Unlike real monks who are bound by the laws of gravity, this monk was able to fly and take one in a flash to the levels of the clerestory if one was interested in that section of the church.

Infobyte's reconstruction of the Tomb of Nefertari[8], which was featured at the G7 Information Society and Developing Countries (ISAD) Exhibition and Conference in Midrand (June 1996), allows a virtual tour of the famous tomb. By touching virtually a section of hieroglyphs one receives a translation of the passage in question.

The Italian Research Council's recent virtual reconstruction of the Cappella degli Scrovegni[9] in Padua offers an important glimpse into how quickly things are evolving. Maurizio Forte points out that whereas interactive reconstructions of the mid nineties typically had 1-5 interactions, the latest examples typically have well over 100.

Since ecologists such as Bateson insist that learning is a function of changes we perceive in our environment, these added features represent much more than extra features that one typically associates with technophiles. The ability of objects to reveal themselves in multiple ways, and describe themselves from different viewpoints may be a key to future learning.

There is of course the problem that once knowledge is written down, there is a tendency to become mentally lazy and not learn it oneself. But this problem, which troubled Plato in the *Theaetetus* and which was one of the starting points for the late Dame Frances Yates' *Art of Memory,*[10] belongs to that category of important scruples which have inspired creative reactions for more than two millennia.

As critical developers and users we need to remain very conscious that the term self-describing objects is largely a verbal short-cut for saying that we have programmed these objects to describe themselves in accordance with a given theory or interpretation. As in the case of all serious scholarship, a breakthrough will come when these self-describing objects are able to reveal the source on which they base their description and a second breakthrough will come when they can reveal to us the alternative and sometimes conflicting interpretations and their sources with respect to the object in question. This is the larger vision underlying virtual reference rooms.

It is important to note that this ability and desire to understand alternative views is very closely linked with politics, ideology and creativity. At one end of the spectrum, dictatorships are fully convinced that their interpretation is the only admissible one and they will set enormous mechanisms in motion to prevent access to alternative evidence, which could or would contradict their position. At a much more subtle level, this same problem emerges in certain schools of intellectual thought which reveal a not dissimilar dogmatism by barking up only one tree and by dismissing all evidence which calls into question the limitations of their own particular solution. At the other end of the spectrum are societies and groups, which provide open access to all the evidence rather than only the bits which most suit them. This openness to alternatives is one of the touchstones of academic freedom, political freedom and indeed all freedom, that is worthy of the name. Moreover, an ability to create things, which may question and even contradict the official view is another one of the starting points for creativity.

4. Alternative Interpretations and World Views

The idea of using visualization to test scientific hypotheses is leading to a new field of scientific visualization. This also has its parallels with respect to historical studies. For instance, scholars at Warwick have recently reconstructed the Odeon of Pericles to claim that 40 % of the spectators could not see the stage properly.[11]

A decade ago reconstructions were often uncritically treated as authoritative versions of how things actually were. Even today technologists are still struggling with a number of formidable challenges in mastering shifts between different technological settings. For instance, CINECA working with RAI is working on the frontiers of translating a virtual reality reconstruction of Pompeii into a virtual set for television programmes.[12] A next step will be to adapt such reconstructions for use in virtual classrooms. Instead of reading about Pompeii a student of the future will potentially be able to walk around in a virtual archaeological site.

Projects such as Archeoguide provide us a glimpse of how one might combine a virtual reconstruction with a physical site to create an enhanced reality view of the Temple of Hera at Olympia.[13] The MUVII[14] (Multi User Virtual Interactive Interface) project explores how haptic modalities might be added to this experience.

Historians since the time of Ranke know, of course, that this quest for how it actually was (*wie es eigentlich gewesen*) is much more elusive than it would at first seem. Once we have mastered the initial technological hurdles of reconstructing visual surrogates of objects, monuments, sites and landscapes, we could use technology to provide access to alternative interpretations of the same object or site.

In future, the methods being used to view augmented reality versions of the Temple of Hera in the Archeoguide project could be extended such that a visitor is able to see the differences between/among interpretations of Greek, French, German and British archaeologists. As such reconstructions offer a tool to visualize differences between individuals, schools of thought and even in national traditions.

J.C. Spohrer[15] building on the ideas of Steve Feiner, has shown how, using a small screen interposed in front of one's eye one can use augmented reality to impose upon the night sky the Greek constellation. In future, an extension of the same principle could enable viewers to see the constellations of the Arabic, Indian, Chinese, Mayan or even the Chaldaean astronomers. An extension of the same principle would help us to see the same statue from a Greek or a Roman viewpoint, from a Hinayana or a Mahayana Buddhist viewpoint. As such augmented reality would become a tool for entering into different world-views.

So-called world-views are more complex than we often imagine. In the West, our cultural expressions are linked with a concept of aesthetic distance, which led to the subject-object distinction. We use cultural expressions to separate ourselves from the depicted or represented reality. In the Orthodox West (Byzantium and Russia), cultural expressions

function almost as visualizations of the Greek middle verb. They both link and separate us simultaneously. By contrast, in the Far East, the purpose of cultural expressions is often to remove subject-object distinctions and to join us with the object in question. For instance, a Japanese Zen Garden is not something we are intended to look out at: we meditate in order that the distinction between the garden's out and our in is transformed into one experience.

One of the great challenges for the future of creativity is for our cultural expressions to make us more aware of such differences and to help us in moving between these different worlds of perception and experience. Theoretically it should be possible to build into our systems these perceptual differences between world views such that we could don an augmented reality "hat" which would help us to see through the eyes of an Indian, an Inuit, etc. If so the new media which are too often used to impose the single viewpoint of a dominant group, could become instruments for helping us to see, experience and to understand the world views and world-senses of others.

5. Quotations and References as Potential Keys to Creativity

We are all familiar with verbal quotations. Each language has its classics in literature. In English the phrase, "To be or not to be" immediately evokes Hamlet and the larger literary world of Shakespeare. In German, *Aller Anfang ist schwer*" evokes Goethe while in French: "*Le coeur a ses raisons…*" evokes Pascal.

Most of the great authors use such quotations extremely liberally. As Dorothy L. Sayers and so many others have shown, Dante is incomprehensible without a thorough understanding of Classical literature. M. A. Screech has demonstrated that the same is true for Rabelais. Indeed centres of learning such as the Warburg Institute[16] have spent almost a century studying the seminal significance of this continual commentary on the Ancient world (*Das Nachleben der Antike*) as one of the fundamental inspirations for creativity. Places which deny this are accused of being "a land of unlimited impossibilities where nothing is so old as the new."

One of the inherent paradoxes of quoting is that few quotes are a sign of poverty, many quotes are a sign of intellectual richness, while only quotes is dismissed as copying and plagiarism. As a sign of good manners we have devised traditions of footnotes, endnotes and references as means of indicating our sources.

Parallel with these verbal quotes there are visual quotes, which entail more elusive rules. It is true that when visual images of paintings, drawings or other objects are used in the context of verbal books, they are typically accompanied by a figure number and a verbal caption to identify both the image and the source of the image. Indeed some countries provide individual copyrights for the owner of the original picture and for the photographer who is the owner of the "original" image of that original picture. On closer examination we can identify a number of different kinds of visual quoting.

6. Kinds of Visual Quoting

Just as there is plagiarism in the verbal world when one copies "blindly", so too is there plagiarism in the visual world except here the situation is more complex. To begin with there are cultures where visual copying is not seen as a bad thing. Indeed, in China one's ability to reproduce an old master was often a measure of one's ability. During the fifteenth and sixteenth centuries this was also frequently the case in the West. Indeed in the case of families such as Brueghel, there are cases of a single painting being reproduced as often as 128 times. We are typically aware of one of the "originals" now in the Kunsthistorisches Museum (Vienna) or the Museum of Fine Arts in Antwerp, but seldom aware of all the copies.

In addition to outright copies, there were typically also versions, variants, variations on, capriccios, caricatures, pastiches, satires. It is also useful to distinguish between everyday visual quoting, cases of topoi with multi-valent visual quoting, creative and finally reductionist visual quoting. The great images of painting and sculpture tend to reappear transformed in the decorative arts.

Everyday

One of the innovations of the Renaissance was to link the tradition of drawing and painting with new technologies such as the woodcut and the engraving, which greatly expanded the scope for usage of these images. These innovations which largely began in Italy were taken much further by Northern artists such as Dürer and subsequently the Brueghels who represented a veritable family dynasty of painters. Not only did they produce many copies and versions of the same work. They reproduced it in different media. Not surprisingly we find their religious topics such as the *Birth of Christ* and *Massacre of the Innocents* in the form of everyday village scenes and other special moments using everyday persons such as the dinner at a *Peasant Wedding*. Elements of these scenes have become adapted for a range of places ranging from shop fronts to comics such as *Suske and Wiske, Donald Duck* and even cinema in Stanislav Lem's *Solaris.*

It would clearly be naïve to pretend that every one of these copies, reproductions or versions in other media necessarily represents a creative contribution and yet, paradoxically, this ability of certain images to inspire a veritable avalanche of variant productions and reproductions is more closely and centrally connected with the creative process than we would sometimes be inclined to imagine. Critics such as Walter Benjamin were fascinated by other implications of art at time when it can be reproduced in all media.[17]

Interestingly enough only a few images are classics: not every portrait of a woman becomes as famous as *Mona Lisa,* no matter how good the publicity campaign. And once a painting has achieved this "classic" position the extent to which it is copied and adapted in all kinds of media and contexts from the sublime to the ridiculous becomes one of the

tests of its position. Only masterpieces generate great numbers of reproductions although certainly not every reproduction counts as a masterpiece.

Topoi and Multivalent Quoting

Part of this complex story entails the tradition of topoi: images based on topics, which have an universal appeal. Sometimes this universality comes from basic topics that are part of our shared experience(s) such as, the four ages of man, the four seasons, the twelve months or a person reading.

These topics reflecting shared experiences were effectively produced in all available media: as monumental frescoes or tapestries, as paintings, as ceramic plates, as little sculptures, even as toys. As with masterpieces only a handful of topoi generated the majority of productions and reproductions although certainly not every reproduction of such topoi was a creative wonder. The richer the topos the wider the range of multi-valent and multi-level expressions it inspired.

Creative

Often the topoi are derived from basic stories, which have become the shared experience of most educated individuals: e.g. the *Three Graces*, the *Birth of Venus*, or the *Birth of Christ*. From the stories of these shared written experiences come many of the creative high points of cultures.

Indeed scholars such as Hanfmann and Gombrich[18] have noted that already in antiquity there were complex interplays between the rise of verbal storytelling and the rise of visual narrative. Accordingly a key to creativity lies paradoxically not in how new and original a story is but rather in how universally well known a story is. A new story imposes many constraints on an artist or creator in order to make the unknown topic comprehensible to viewers. A story such as the *Birth of Christ* was so well known in the Christian West, that Renaissance painters could take the basics for granted and concentrate on versions that reflected regional traditions or local schools.

This close interplay between the rise of verbal and visual creative expressions is too often overlooked. Indeed if we examine the great fresco cycles[19] from the Romanesque versions in the Reichenau, through the examples of Giotto at Assisi and all through the Renaissance, it is striking how these great visual expressions all have verbal texts as captions. The rise of new visual creativity went hand in hand with well-known verbal texts. Visual quoting was much more than borrowing images: it was a creative rearrangement of known elements.

One of the reasons why these local and regional variants are so rich and so centrally connected with the "essence" of culture is that they transform the universally known stories, themes and topics into expressions that reflect the local realities and ultimately the unique, individual characteristics of a given painter, sculptor or other creative spirit.

It follows that we need new access to this richness of the past in order to inspire the richness of the future.

More recent examples such as Marilyn Monroe may bear little resemblance to the Virgin on a moral plane and yet offer interesting parallels on a visual plane. It is precisely because this portrait has become well known to the point of effectively being a modern day topos through the variants of pop artists such as Andy Warhol, that Marilyn is inspiring an enormous amount of copies, variants, and creative versions, not just as paintings but also as computer animations and potentially even as film.

In architecture, the mediaeval tradition of combining a wooden structure filled in with stucco, known as *Fachwerk* in German and remembered as Elizabethan architecture in English, provides unexpected examples for our theme. Once again the principle is a well known-one and used throughout most of Europe. What is remarkable however is how each town and city: e.g. Bamberg, Braunschweig, Hildesheim, Hornburg, Marburg, Quedlinburg and Wolfenbüttel develop their own inimitable version of the same technique such that an expert need only to look at the pattern to recognize the town involved.

Reductionist

We have already made the seemingly circular statement that every masterpiece generates variants but not every variant is a masterpiece. Is it possible, then, to identify which kinds of visual quotes are less creative than others? Perhaps not, but it is worth making an effort at the peril of entering infinitely treacherous waters.

Brueghels' *Peasant Wedding* cited above has inspired both *Suske and Wiske* and *Donald Duck*. They are both comics and thus at first appearance are effectively the same. On closer inspection the two are very different. In *Suske and Wiske* the protagonists thanks to the magic of a ghost enter into the space of the painting and the original characters retain their individuality. In *Suske and Wiske,* Brueghel is slightly simplified into comic form but the uniqueness of the figures remains.

In *Donald Duck* all the original figures become non-individual ducks and the traditions of Brueghel are replaced by a copyright of Disney. There is just enough of the original left that we are able to recognize it as a quote from Brueghel, but there is too little left that we would associate it with the essence of Brueghel. There is no longer anything to link this with a peasant wedding in a given time, place or region. The Disney version, a "Ducklination" or McDonald Duck-isation," could be anytime, anywhere. It is without cultural and historical dimensions in the European sense.

Two very different examples may bring us closer to understanding the complex transformations that are at play. The Ducal Palace and Saint Mark's Square in Venice represents an architectural topos known around the world. At first sight, the Venetian Resort-Hotel-Casino in Las Vegas as an architectural quote is fully in the tradition of visual quotes, which are a subject of this paper. On closer examination, we note that the

American version has repositioned the two columns with the lions of Saint Mark, has changed the position of the bell tower and has moved the Rialto Bridge almost half a kilometer in order that it almost collides with the Bridge of Sighs. What looks like a quotation is actually a frivolous capriccio. Such playful games are of course familiar from Europe with one basic distinction: one typically knows when a visual quote is a serious citation and when it is a playful caprice. In the Las Vegas Venetian there are no such clues. This too is lacking cultural and historical dimensions.

Another set of examples entails Santa Claus.[20] In Europe, Santa Claus derives from a historical figure, Saint Nicholas of Bari, who became famous through his activities as Bishop of Myra in a port on the South coast of Turkey.[21]

In America, if one observes that Saint Nicholas was an Italian living in Turkey one is regarded as out of line and definitely unpatriotic. The red and white Santa is a US invention linked with Coke advertisements. Santa is a positive symbol. The US is a positive symbol, so a combination of the two is doubly effective. Accordingly Santa appears waving an American flag and has the title: Possible Dreams, God Bless America, plays Stars and Stripes for Ever, is linked with the Civil war when convenient, becomes a Black Santa when it is politically appropriate and in a post September 11 version, the American Santa Claus becomes a fireman patriot carrying an American flag.

The reasoning is simple: Santa is a very positive figure. Firemen proved that they were very positive and were under-appreciated. So a simple combination of these two symbols makes a more positive and successful symbol. The historical burdens of time and place, the local variants that are crucial ingredients for the complexity of European culture play no role in this consideration. The cultural consequences of the melting pot, from the many, one, (*e pluribus unum*), are that cultural diversity disappears. Symbolism ultimately has no regional or local variants, and anyone who differs from this ideal is not a patriot.

Traditionally, of course, one of the reasons why America has been so fascinating is that these regional and local variations continued there also. New York was not America, nor was Washington. America lay in the quaint fishing villages of the East coast, the farm towns of the mid-west, the near forgotten mining towns of the Rockies, the unexpected riches of the South and the ever-surprising alternatives of the West coast.

However, the extreme version of the American ideal of a melting pot means that everyone is subject not only to the same flag, but ultimately to the same expressions independent of time and place. The tendencies towards McWorld, the McDonaldization of Culture, the Disneyfication of Brueghel, "Las Vegas-ification" of Venice and the "Fireman-isation" of Santa are all consequences of a decision to ignore the uniqueness of regional and local variants that we associate with creative expression.

The advantages of this decision are considerable. The attitude of stars and stripes apply uniform-ally across all the states and in all states. The attractions of Disneyworld can be moved to Tokyo or Paris without understanding the regional and local differences. One

can reproduce the same images on all media from television cartoons to bath towels and tee-shirts all over the world. One can even borrow themes from other verbal (literary) and visual (artistic) traditions and then claim that one has copyright over them. One melts differences into one's melting pot and then claims ownership over all the consequences.

To understand the limitations of this reductionist approach to culture it is useful, for a moment, to stand back and consider three basic types of knowledge:

1) Enduring knowledge, which we associate with collective memory institutions such as libraries, museums and archives.
2) Collaborative knowledge, which we associate with high-energy physics and increasingly with new design methods for large scale products such as the Eurofighter.
3) Personal knowledge, which began in digital form as e-mails and expanded to include MUDs, MOOs, chat rooms, messaging systems and much more.

The extreme American approach links originals with enduring knowledge, but tends to separate them from their temporal-spatial co-ordinates. The links between a particular version of *Little Red Riding Hood* collected by the Brothers Grimm in Kassel in the mid 19th century becomes irrelevant and the universal melting pot version of the story becomes something which can be owned.[22] This mentality is leading some US companies to buy not only the copyright of some images of Marilyn but also the copyright of all the possible motions a real and/or virtual Marilyn made or could have made.

Once one believes one owns the original then one can make a business of the copies, which explains the megalomaniac tendencies of some American Broadcast and Content Industries. In this model, enduring knowledge is the domain of big business and separated entirely from collaborative and personal knowledge. All this may sound so convincing that many may assume there are no alternatives. We shall argue that there are.

7. Alternative Ways to Creativity

A first step towards an alternative approach is to begin with a simple question: Would there ever have been a Renaissance if the theme of the *Birth of Christ* or all the possible images of the *Bible* had been copyrighted? The answer is almost certainly not. Would we have such interesting images of Marilyn Monroe if companies such as RetroFilm.com literally owned the rights of all virtual thespians? The answer is almost certainly not. Would there be a human civilization if God (or whatever we call the Creator) had a copyright on his creation? Certainly not.

In retrospect it is easy to recognize that the genius of the Renaissance was to establish close links between enduring knowledge (of memory institutions at the time looked after by both the Church and increasingly by Dukes, Princes, Kings and their feminine, often superior counterparts), collaborative knowledge (at the time in the form of bottegas, workshops and ateliers) and personal knowledge in the form of individual artists and creators.

Instead of pretending that the originals were owned exclusively by certain individuals there was a conviction that by sharing this common heritage (or patrimony) the original would lead to copies and via shared and personal versions to new creativity. The past was a cumulative collection to inspire an ever-evolving future.

If we look around today we have lots of tools for verbal quoting in the form of footnotes and references, but really very little in the form of serious quoting from the visual realm. Admittedly Adobe makes some quoting and editing possible. Techniques such as Scaleable Vector Graphics (SVG) and Web 3-D address some problems in this field. There are some tools for editing film. There are tools by Avid, Philips, Sony, but we have effectively no tools for systematic cross-media visual and verbal quotation.[23]

8. Universals and Particulars

Not surprisingly, the differences between the extreme version of America and Europe, have their roots within Europe and a long history that can be traced back over two millennia to the discussions of Plato and Aristotle concerning universals and particulars. There were universal categories and then there were individual or particular examples. If one could understand the universal category, then the "minor" variations within that category were no longer very important. Or so it seemed at the time. One understood the big picture and was therefore spared the embarrassing trouble of the details. This led to a triumph of deductive over inductive science.

It took western philosophy more than a millennium before Mediaeval philosophy brought universals and particulars back to the forefront of discussion and concluded that the particulars were every bit as important as the universals and might indeed be more important. This led to an increasing commitment to inductive science and ultimately to fruitful combinations of inductive and deductive approaches, using the details of the inductive as touchstones and tests for the deductive. These combinations led to the breakthroughs of Kepler, Galileo and later Lavoisier and much of modern science.

As with all fundamental problems they never go away: they only take on new forms. In the world of computer programming there is an extreme group usually associated with artificial intelligence who have taken up the side of the universals: who believe that *if* only one could find the absolute categories *then* one could solve all the problems without needing to pay attention to the details.

This school has had an enormous impact on the world of industry. It has led to the creation of Industry Foundation Classes (IFC), the belief that if one defines all the characteristics of a door for different kinds of buildings one will arrive at intelligent doors such that one is spared the trouble of ever drawing all the local complexities of doors. This quest is linked with larger visions for a Standard for Exchange of Product Information (STEP) and of Intelligent Manufacturing Systems (IMS). It is leading to specific programmes such as the Building Objects Warehouse (BOW) and Advanced

Reusable Reliable Objects Warehouses (ARROWs), which serve as distributed object libraries (databases) created, populated, and maintained by information providers.

It is important to recognize that this quest for "intelligent" doors, windows and other building elements, represents the quest for the universal in a new guise. Applied naively it will lead to precisely that McDonaldization against which the anti-globalists warn. Universal programmes produce universal doors and windows but give us no clues about the uniqueness of the doors of Saint Zeno in Verona, Ghiberti's doors for the Baptistry in Florence or any of the other myriad entrances of the Renaissance.

The reason for remembering history is to remind ourselves that the solution is not either/or but rather both/and. The power of the universals is the power of the generic based on universals that is the basis of science, technology, manufacture and industry. The richness of the particulars is the abundance of the original, and the unique that we associate with the arts and culture.

Needed somehow is a combination of these approaches: technology, which provides us a) with the universal structures and b) gives us access to databases with all the variations such that we can build into the standardized safe structures the unique characteristics which will express the inimitable regional and local dimensions.

These databases need to be linked with new editing tools whereby both verbal and visual quoting are an integral part of the software, where access to enduring knowledge is combined with spaces for collaborative and personal creation and co-creation. Under discussion is something very different than a simple copying of films, videos or other formats. Plagiarism remains an enemy, piracy is not the order of the day and legitimate copyright is not under attack.

The challenge is to find new ways of visual and verbal quotation, of reference, of building on the richness of the past to arrive at a more creative future. This is one of the quests of the art nouveau group and this is why a greater awareness of the past is useful. Combining the universal approaches of science and the particular approaches of art from the past and the present is a key to future creativity. Linking art nouveau with the evolving E-culture net[24] is one way for fostering this quest for creativity.

Maastricht 30 April 2003.

Notes

[1] *The State of the Japanese Internet Market 2000 Digest*, Tokyo: Impress, 2000, p. 59. Cf. Ken Ichiriki, *Study Group on the Next Generation Internet Policy, e-Japan Initiative for the IT Revolution*, June 2000.

[2] http://www.ercim.org/publication/Ercim_News/enw47/intro.html

[3] http://www.iamas.ac.jp/interaction/i97/artist_artcom.html

[4] http://www.ai.sri.com/TerraVision/

[5] http://www.storiaeinformatica.it/nume/italiano/ntitolo.html

[6]   Cf   the   work   of   Steve   Feiner   et   al.: http://www1.cs.columbia.edu/graphics/publications/iswc97.pdf

[7] The embedded cameras of the recent war in Iraq are one manifestation of this trend.

[8] http://www.infobyte.it/home_text_en.htm

[9] http://www.mlib.cnr.it/vhn/SitoScrovegni/Obiettivi%20del%20sito.htm

[10] http://www.press.uchicago.edu/cgi-bin/hfs.cgi/00/2632.ctl

[11] http://news.bbc.co.uk/2/hi/technology/2950661.stm

[12] http://www.cineca.it/HPSystems/Vis.I.T/Researches/rvm4vset.html

[13] http://archeoguide.intranet.gr/

[14] http://www.hpclab.ceid.upatras.gr/muvii/project.html

[15] http://www.research.ibm.com/journal/sj/384/spohrer.pdf. Cf. http://www1.cs.columbia.edu/graphics/courses/mobwear/reading.html

[16] http://www.sas.ac.uk/warburg/

[17] http://www.rossleben2001.werner-knoben.de/doku/kurs76web/node11.html cf. http://www.beckmesser.de/theorie/benjamin.html

[18] E.H. Gombrich, *Art and Illusion*, Princeton University Press, 1960.

[19] For a survey see the author's "Narrative, Perspective and the Orders of the Church", *I Meeting Siena-Toronto*, Atti, [*Acts of Meeting in celebration of the 750th anniversary of the University of Siena*, 1991, Siena], ed. S. Forconi, Siena: Edizioni Alsaba, 1993, pp. 123-162.

[20] www.christmas-treasures.com/ Store/Patriotic/

[21] In some countries such as the Netherlands these historical facts were "adjusted" when they were being ruled by Spain with the result that Saint Nicholas arrived by ship form Spain. Even in this case a specific set combination of historical and geographical realities determine the symbolism.

[22] Lawrence Lessig has explored other dimensions of this phenomemon . Cf. http://cyberlaw.stanford.edu/lessig/ and especially his lecture at the Internet Society, Arlington, 2002.

[23]   For   a   review   of   this   domain   see: http://viswiz.gmd.de/DVP/Public/deliv/deliv.221/Act221del.htm

[24] http://www.mmi.unimaas.nl/eculturenet/index.htm.