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Goals of Culture and Art

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1. Introduction

Culture is a many splendoured thing with many definitions.¹ In the West, culture is often associated with the fine arts (painting and sculpture) and the performing arts (opera, ballet, symphony, music, theatre). In other parts of the world it includes many other aspects. In Ancient China, for instance, "calligraphy, poetry and painting" were considered the three perfections.² In modern China culture one definition of culture is "mass media, education, art and sports."³ In the Arab net⁴, culture is defined primarily in terms of "people, language, food, media and religion." Other categories of culture on Arab net include: arts, beekeeping, calendar, ceramics, clothing, embroidery, frankincense, the Hajj, jewellery, tents of the Arabian desert and the role of women.⁵

Cultural heritage is certainly much more than paintings in galleries and objects in museums. As UNESCO has made us aware cultural heritage includes archaeological sites, historical cities and remarkable natural sites (e.g. Plitvice Waterfalls in Croatia).⁶ At a deeper level cultural heritage is a key to understanding how each culture has its own principles of knowledge organisation, interpretation and expression. Culture relates to how we see the world differently and is thus closely linked with philosophy, our principles of truth, our theory and practice of society. Culture relates to how we learn and how we transmit what we know in different ways. Culture and education are thus intimately linked.

The Internet is global and all over the world there are efforts to digitize essential aspects of different cultures. In connection with the G7 exhibition on the Information Society (Brussels, February 1995), for instance, eleven pilot projects were initiated, including Multimedia Access to World Cultural Heritage. At the European level, this was complemented by a Memorandum of Understanding for Multimedia Access to Europe's

Cultural Heritage, which has led (October 1998) to the MEDICI Framework.⁷ Meanwhile, UNESCO has a collection of World Heritage⁸ sites and a Memory of the World Project.⁹ In October 1999, the government of Italy in conjunction with UNESCO and the World Bank will sponsor a conference on culture and business.

There are at least four fundamental problems facing such endeavours. First, there is a problem of money. As Philippe Quéau at UNESCO has pointed out the annual budget of UNESCO is equal to seven minutes of the annual budget of the U.S. military. Perhaps if persons become more aware of the inestimable value of culture, even in its purely economic implications through tourism, there will be more support for the approaches here outlined. Ultimately culture is about understanding others. If this existed there would be no need for senseless wars such as Kosovo, and we could use our scarce resources much more sensibly.

Second, there are obvious questions of standards to ensure interoperability of the pipelines, of different hardware and software.¹⁰ Third, there are problems of interoperability of content which need to be solved if text, images and multimedia produced in one part of the world are to be accessible in other parts of the world.¹¹ Fourth, and this is the focus of the present paper, there is a problem of developing new frameworks to study and to understand the enormous amounts of materials which are becoming available.

For instance, one of the traditional fields for the study of culture is art history. Most treatments of this field are on a national basis: hence there are studies of Italian, French, German, Chinese, Japanese, Malaysian, Australian, Canadian and American art. Some treatments are in terms of the world's great religions: e.g. Buddhist, Christian, Hindu, Islamic, and Jewish art. Although standard university textbooks such as Janson's *History of Art* make token efforts to acknowledge major cultures such as India, China Japan and Islam, they remain essentially Eurocentric in their vision. Indeed, on closer inspection we find that these textbooks are frequently written by scholars in or with access to major centres such as Vienna, Paris, London, Berlin, or New York. The experts cited what was familiar to them. Hence, the paintings of those centres have typically defined our canons of art and culture. We need new canons, which reflect more universal values.

This paper begins by exploring dimensions of culture beyond the fine arts, with particular reference to those in non-European cultures. Two goals of art in non-literate societies are identified. This leads to a re-examination of fundamental goals of culture in a European context with a view to using these for a more international view of art and culture. Section four addresses briefly some global threats to culture. Section five outlines the need for a world map of cultural values, which leads to consideration of some of the problems concerning meta-data which are implicit in such a quest. Many of the specific examples will remain those of Western art. No attempt will be made to be comprehensive in our treatment of all cultural objects and expressions. Our concern, rather, is to explore a framework which will allow a balanced study of all cultures in order to approach seriously the challenges posed by seeking Multimedia Access to World Cultural Heritage.

Country	Language	Food	Media	Religion	Other Categories
Algeria	x		x	x	
Bahrain	x	x			x Living in
Comoros					
Djibouti					
Egypt	x	x	x	x	Population, Arts, Artists, Beekeeping
Iraq			x	x	
Jordan			x	x	Drink, Embroidery, Ceramics, Pottery, Jewellery, Weaving, Basketry, Blown Glass
Kuwait	x	x		x	x Society, Education, Foreign Workers
Lebanon		x	x	x	Drink, Education, Arts
Mauritania	x	x			Traditions
Morocco	x	x		x	Moroccan Pottery
Oman	x			x	
Palestine					
Qatar	x	x			x
Saudi	x	x	x	x	Clothing, Calendar, Arts, Bedouin Gahwa (Coffee Making), Hajj-Pilgrimage to Makkah, A Middle Eastern Lilliput, Jewellery, Miswak- A National toothbrush, Tents of the Arabic Desert
Somalia				x	Frankincense, Somali the Sub
Sudan			x	x	Drink
Syria				x	
Tunisia	x	x	x	x	
UAE	x	x			Population, Role of Women
Yemen	x		x	x	Architecture

Figure. 1. List of countries in Arab net¹² and their categories for culture. Compare a Chinese network, which lists mass media, education, arts and sports under culture.

2. Culture Beyond Art

As noted above, there is a tendency in the West to associate culture particularly with the fine arts, i.e., painting and sculpture, and the performing arts, symphony, opera, ballet and theatre. One of the interesting paradoxes of the West is that these two strands of culture, the fine arts and the performing arts often exist as if in competition. The audiences who go the performing arts are often different from the “vidiences” who go to museums and galleries. At a more subtle level the themes used are also rather different. The fine arts rely heavily on the *Bible*, the Lives of the Saints and the great classics of literature: the *Iliad*, the *Odyssey*, the *Aeneid*, and the *Divine Comedy*. The performing arts often rely on different literary sources. Wagner’s operas rely on the legends of the *Nibelungen*, the tale of *Tristan and Isolde*. The story of *Romeo and Juliet* inspired Shakespeare to write one of the greatest theatrical plays, and Tschaikovsky to write one of the greatest operas of all time. These Western literary sources for the performing arts inspired none of the greatest paintings of all time.

This seeming co-incidence becomes all the more noteworthy when we realize that the East has very different traditions. In India, Burma, Cambodia, Malaysia and much of South-East Asia, for instance, the greatest literary epics, namely, the Mahabharata and the Ramayana, have a fundamental influence on the fine arts (painting, sculpture, drawing, illustration) and an even greater influence on the performance arts (puppets, theatre, opera, dance, folk songs, music).¹³ In short, the East¹⁴ does not have the same oppositions between fine art and performance arts which are found in the West.

In earlier centuries the English thought of culture as a “refinement of mind tastes and manners,” as the “intellectual side of civilisation,” while Matthew Arnold saw Culture as “the acquainting ourselves with the best that has been known and said in the world.”¹⁵ In the English language, culture is a more widely used concept than civilization. There is, for instance, a story that Dr. Johnson planned to drop the term civilisation from his dictionary. In German, by contrast there are great debates about the relative values of *Kultur* and *Civilization*. To complicate matters, most of what the Germans cover under the idea of *Civilization*,¹⁶ is covered by the English term culture. (Ergo English culture is not German *Kultur*).¹⁷

While English refers constantly to other cultures, the nineteenth century Victorians typically frequently assumed that the English tradition offered a model, which all others could try to imitate.¹⁸ In the field of history, for instance, this led to *Deacon's Synchronological Chart of Universal History*¹⁹ (1890), drawn by Professor Edmund Hull, whose unbridled optimism, spurred partly by Archbishop Usher's scheme for chronology, assumed knowledge of the precise day on which God created the earth, and surveyed all of culture and civilisation in a single chart some five meters long. While international, this chart is still very much from a Eurocentric and indeed from an Anglo-centric viewpoint.

Once we look to cultures around the world the predominance of the fine arts subsides and a much more complex picture emerges. In the National Museum in Taipei, for instance, there is a more recent attempt to draw parallels among all the major civilisations in both the East and the West on three walls of one of their large rooms, which is quite different from Professor Hull's model. A simple search through Arab net confirms that their four most basic concepts of culture are people, language, food (and drink), media and religion. Other categories include arts, artists, architecture, basketry, beekeeping, blown glass, calendar, ceramics, clothing, education, frankincense, population, pottery, role of women, tradition, and even foreign workers (figure 1).

For the purposes of this paper we approach culture in terms of shared experiences, which arise from a small number of different goals for culture and art. At the outset a clear distinction is needed between pre-literate and literate cultures. In pre-literate cultures two goals dominate: connecting and ordering.

Connecting

In pre-literate times, a first stage of culture emerges as basic needs for survival lead to expressions that go beyond survival: food makes its first steps towards cuisine; utensils towards decorative arts and shelter towards architecture. Precisely because these earliest societies are pre-literate we can have no comprehensive picture of their cultural objects. Indeed our knowledge is limited to materials found in archaeological remains. At this level of culture there is an interesting paradox. On the one hand, these products of food, utensils and shelter serve to connect societies to the earth. On the other hand, as the society advances this connecting function becomes increasingly obscured, as the products of nature are increasingly changed into products of artifice.

Parallel with this linking to the earth (what we now call the profane) and often integrally linked therewith is another sort of connecting with things beyond the individual (what we now call the sacred) as defined by myths and customs, which take the forms of music, dance, song, language and later writing. As the *Oxford English Dictionary* reminds us, the term culture is etymologically linked with cult: with something that one worships.²⁰

So called primitive art²¹ had a function of connecting a totem in a community with a magical or sacred world beyond it. This connecting function meant that a totem actually became a given deity rather than being a simple representative thereof. A sculpture suited this function much better than a painted representation. Because it served as a bridge between the everyday world of the tribe and a magical world beyond, it had to be sufficiently life-like to be recognizable by its viewers: i.e. anthropomorphism was an inherent part of the system. Yet a fully realistic statue would have linked it too firmly to the present world and thrown into jeopardy its connecting function with a world beyond: i.e. a restricted anthropomorphism was also built into the system. In such a context perspectival realism would have been more of a threat than a goal.

Since these tribal communities were pre-literate there were no canonical texts concerning the shape and meaning of the statue. And in the absence of these sacred texts to establish a sense of community, the sacred statues acquired proto-canonical functions themselves and forged this sense of community directly. Hence any serious deviation in outward appearance was a threat to its connecting function because it introduced the risk that a specific god would not even be recognized.

	Survival	Survival + → Culture
Connecting to Earth (Profane)	Food	→ Cuisine
	Drink	→ Tea, Wine
	Utensils	→ Pottery, Metalware
	Shelter	→ Architecture
Connecting to Beyond (Sacred)	Animism	→ Myth, Legend → Religion
	Customs	Customs → Society
	Music	→ Symphony
	Dance	→ Ballet
	Song	→ Opera, Musicals
	Language	→ Poetry
	Writing	→ Calligraphy

Figure 2. Aspects of the goal of connecting, which is one of the basic shared experiences in pre-literate society.

Since polytheism was the rule in pre-literate societies these principles usually extended to a number of gods. As the number of gods increased, the powers, which could be attributed to a given god decreased. Such considerations meant that there were natural controls to keep in check an indefinite extension of these sacred images. In this context the pantheon of images which would have been possible through perspective was necessarily a threat to be avoided rather than a goal to be sought. The connecting function thus precluded an interest in this-worldly, perspectival space, focussing attention instead on a totem, which would ensure contact with a world beyond.

Ordering

A second goal, which emerged among primitive tribes involved ordering, producing patterns and ornament beginning with simple regular lines and evolving to ever more complex geometrical shapes. In pre-literate societies these patterns were usually restricted in number and had sacred connotations such that they shared partly in the connecting functions of totems. In some cases, these patterns were applied directly to the totems, such that, both the connecting and ordering functions were contained. A gradual distinction between the two functions was inevitable, however. For whereas the connecting function effectively depended on a pre-literate society, the ordering function did not. The advent of literacy simply extended its repertoire as Sir Ernst Gombrich has so eloquently shown in a *Sense of Order*.²²

Some patterns could even be given spatial characteristics. The meander fret could, for instance, be given a three dimensional effect through a clever use of light and shade. Yet although some sense of depth was possible, systematic treatment of space was not. Hence ordering was another goal, which discouraged perspective in its full sense.

Ordering (Pattern)	Survival	Survival + → Culture (Luxury)
	Basic Crafts→	Beekeeping
		Glass Blowing
		Frankincense
		Jewellery
	Ornament →	Baskets
		Ceramics
		Embroidery
		Pottery
		Weaving

Figure 3. Aspects of the goal of ordering, which is another of the basic shared experiences in a pre-literate society.

Connecting and ordering are both concerned with making sense of the world, with imposing on the seemingly capricious forces of nature some order and pattern. For this reason they also include a number of basic crafts. And while connecting and ordering inevitably have their origins in pre-literate societies, aspects of these cultural activities continue into literate societies.

The sense making dimensions of connecting and ordering are so fundamental that they continue to the present day. In China, for instance, utensils evolved into a complex set of cultural artifacts including bronzes, cloisonné, jade, lacquer, macramé, pottery and porcelain. In the Islamic tradition where there is a strong tendency towards iconoclasm, ornament plays a greater role than elsewhere. Here the geometrical patterns in architecture, on ceramics and pottery, in carpets, tapestries, and embroidery often have an overtly religious and metaphysical meaning.²³

3. European Goals of Literate Culture

In the previous section we outlined briefly two fundamental goals of pre-literate societies. In this section we shall turn to consider somewhat more closely four further goals in literate cultures: imitating, matching, mixing, exploring. While our examples will rely mainly on the European context, the concepts are of interest for two reasons. First they provide a framework which takes us beyond the naïve notion of a single goal of art. Secondly and more significantly these general goals lend themselves to being extended for a global map of culture.

Imitating

The primitive mind which saw images as connecting with a magical world beyond, believed in an identity of image and god. A next stage in civilization denied this identity and recognized that the two were separate: that the image was at best an imitation or representation of the god involved. If this distinction between the two mentalities was

logically simple, psychologically the distance between them was enormous and occurred gradually during the period between c. 4000 and c. 500 BC.

The shift from connecting to imitating was closely linked with the emergence of literacy in the cultures of Akkad, Babylon and Egypt. Thus far the connecting function had been limited to sacred images. Now it spread to sacred texts and those who controlled them. In Egypt, for instance, the *Sacred Book of the Dead* became a repository of these magical connections as did the pharaoh. This posed new problems for the production of images. On the one hand, if an image of the pharaoh was to function as a (living) image rather than a representation, it had to become fully realistic and lifelike. On the other hand, this very realism undermined the statue's connecting function, which linked it with an other-worldly realm. Instead of being recognized as an immortal figure, it now risked being seen as representing an all too mortal figure. One protection against this was to control viewing conditions: placing the statue in a dark place, laden with other-worldly atmosphere under ambiguous conditions, which is precisely what the Egyptians did. The statue in the doorway of the Mastaba of Mereruka at Saqqara comes to mind.²⁴

These principles, designed for a supposedly immortal pharaoh, were inevitably extended to others in his midst. By c. 2580 B.C. these included members of the royal household in the form of reserve heads at Giza (now Cairo, Egyptian Museum). By c. 2400 B.C., they included mortals, such as a seated scribe from Saqqara (Paris, Louvre). As this repertoire of mortal images increased, the need to recognize them as representations rather than (living) images became more acute. The crisis or so-called revolution came in Greece. In Sir Ernst Gombrich's account: "when classical sculptors and painters discovered the character of Greek narration they set up a chain reaction which transformed the methods of representing the human body--and indeed more than that....Narrative art is bound to lead to space and the exploration of visual effects." For this reason he believes that it was:

surely no accident that the tricks of illusionistic art, perspective and modelling in light and shade, were connected in classical antiquity with the design of theatrical scenery. It is here, in the context of plays, based on the ancient mythical tales, that the re-enactment of events according to the poet's vision comes to its climax and is increasingly assisted by the illusions of art.²⁵

According to this account, an interplay between literature and art sparked the Greek revolution in art, introducing a form of imitation which amounted to matching objects in the visual world, i.e. perspectival representation. Thereafter the Renaissance was little more than "the return to the classical ideal of the convincing image."²⁶ As we have claimed elsewhere the situation was more complex. Mimesis or imitation meant at least five different things. We shall examine each in turn to show that none of them was synonymous with matching in the perspectival sense.

A first meaning involved imitation of verbal narrative. If we accept Gombrich's fundamental insight that narrative texts inspired much of Greek art, we must also accept

the consequences. Representations of verbal descriptions of visual objects were not direct records of the visual world. They were imitations, via a verbal filter, of Greek literature which, as Auerbach²⁷ has shown, had no clear sense of reality when compared to the Judaeo-Christian tradition. The resulting art may have had visual effects or the appearance thereof, yet it remained non-visual in terms of its sources. It never aimed at recording visual reality directly and as such was never concerned with perspective.

A second meaning involved imitation of ideal concepts of objects and persons. There is a well-known story of the Greek sculptor commissioned to do a statue of Venus who studied different virgins and the combined their features in producing his ideal statue. Here again there was no interest in recording an individual visual record. This was imitation via the filter of a mental visual image based on a universal concept of Venus which, it will be noted, amounted to much the same thing as a verbal filter. Both mental visual and verbal filters were universal and ultimately opposed to the individuality of a perspectival record. Hence this second kind of imitation was equally non-visual.

A third meaning entailed imitation of objects in isolation. The same principles which had led in Egypt to detailed images of the pharaoh and isolated members of his court were extended in the second millennium B.C. to isolated animals and birds such that we find in an otherwise primitive scene, a lion or some geese of striking realism.²⁸ This attempt to copy simple objects precisely continued in Greece but usually in terms of statues rather than paintings. It was presumably to this end that Polycleitus developed his famous canon, a statue which served as a model for others. Pliny also recounts the story of illusionistic grapes by Zeuxis, which fooled the birds and the illusory curtain by his competitor, Parrhasius, which in turn fooled Zeuxis.²⁹ These again involved isolated objects rather than contexts, and not unlike similar effects in ornament, depended on some simple tricks of light and shade rather than principles of perspective in order to achieve their results. More significantly we are told that this type of realism represented an early stage: that artists first represented objects as they were and later as they appeared.³⁰ Had the Greeks discovered perspective it would have been in the later period. But as will be shown, this period also had goals inimical to perspective.

A fourth meaning involved imitation of objects using optical adjustments. This was a possibility, against which Plato complained in his *Sophist*.³¹ It entailed adjusting the original proportions of statues in order that they appear correct. Based on a theory of visual angles, this method imposed on an object a mental concept of how it ought to appear. For it sought to integrate effects of size and distance in the object and keep the image constant. This was a goal fundamentally different from Renaissance perspective, which began with the premise that objects remained constant and sought to record visually effects of size and distance on images. For this reason the visual angles method was paradoxically non-visual in the Renaissance sense of the image. It did not visually record, but rather it physically adjusted objects, so that no change in the visual appearances would be noticeable. As we have suggested elsewhere, the same mentality applied in astronomy.³² Saving the appearances was more important than the actual causes governing them. Subjective appearances dominated over objective.

An important shift had begun. The primitive mind had projected magical qualities onto its images. The semi-civilized mind projected its theory of appearances onto images while the civilized mind has attempted³³ to produce images devoid of these psychological projections. And the domain of study shifted accordingly from an unseen, magical world beyond to a conceptual world of appearances and finally to a perceptual, visual world of objects. As long as psychological projection onto images continued, study of their perspectival aspects could not yet begin in earnest.

A fifth meaning of imitation involved illusionistic effects of stage scenery using optical adjustments methods, which were also affected by this problem of psychological projection of a theory of appearances onto objects. But here there was also a deeper problem on which we touched in our analysis of the famous Vitruvian passage elsewhere.³⁴ The stage settings were illusionistic in a special sense. They involved hypothetical buildings, which never have existed in the physical world. Nor could the space they appeared to represent. Unlike perspective, which permits a measured relation between pictorial space and real space, here the buildings and spaces produced a fictive world closed onto itself.

Hence mimesis was many things, and the Greek revolution introduced approaches to art as representation, which resembled matching. But ultimately these involved imitating distorted by a mental³⁵ visual or a verbal filter. There existed as yet no systematic quest to record the visible world passively, rather than imposing adjustments on it actively.

Matching

The subtle shift from imitating to matching became a conscious programme during the Renaissance when, as Vasari noted, artists: “sought to reproduce what they saw in Nature and no more and thus they came to consider more closely and understand more fully. This encouraged them to make rules for perspective and to get their foreshortening in the exact form of natural relief.”³⁶

It is important once more to stress how gradual was this process. If, for example, we consider some of the chief themes open to artists we could list at least eight basic visual themes in the natural world: portraits, human figures, persons at work, persons at war, persons at play, animals, landscapes, man-made objects, and four other verbal-visual sources deriving from literature (myth, literature, religion, history). Most images in the Renaissance and the chief instances of perspective were inspired not by the visual themes (1-8), but by religion, and specifically, the *Bible*, and a few books on lives of the saints. Or to put it slightly differently, matching could involve the visual world; the visual world illustrating verbal sources, i.e. manuscript illustration; and the visual world illustrating implicit common verbal sources, as in books such as the *Bible*, which were so much a part of a general cultural heritage that their basic themes could be taken as implicit and requiring no explanation. It was the final of these alternatives which inspired the most striking cases of Renaissance perspective. To understand this we must return to the problem of narrative.

Narrative

In terms of narrative, it was precisely the best known stories which generated the classic examples of perspective. For instance, in the life of Christ, it was particularly the *Annunciation* (e.g. pl. 83.1-4) or the *Last Supper* which became topics of perspective, although other themes included the *Birth*, *Adoration of the Magi*, *Flight into Egypt*, *Preaching in the Temple*, *Marriage at Cana*, *Flagellation*, *Crucifixion*, *Emmaus* and the *Resurrection*. Why should the best known stories become the most perspectival ones?

A contrast with conditions of primitive connecting and Greek imitating is instructive here. In pre-literate societies the statue of a god, as an object which members of a tribe had in common, helped to define the group's communality. As already mentioned, this limited potential variations since deviations from the norm involved risk that the statue would no longer be recognized. With the advent of literacy, this changed. Texts recorded the characteristics of a given god or Deity, thus providing a corpus of what persons knew and had in common, a sense of communality, and since this burden no longer lay with the image, it could now be varied. The more famous a story became through texts, the more liberties could be taken with its representation. Perspective was a key to varying images. Hence the best known themes also became the best examples of perspective.

With respect to the Greeks, it will seem that we have contradicted ourselves. For if Greek narrative precluded perspective, why then should Biblical narrative involve perspective? As Auerbach has shown³⁷ the two traditions had fundamentally different approaches to reality. The Homeric tales were fictions guided by rhetorical ends of story telling, conflating myth and history, leaving no clear relation to reality. The Biblical stories, by contrast, were based on a belief in creatural realism, and were historical, such that their temporal and spatial coordinates were usually clear. The interpretation of Biblical narrative given by the Franciscan movement stressed this creatural realism. The birth of Christ was not merely treated as a story: a real child was laid in a manger and local peasants re-enacted the role of Mary, Joseph and the shepherds.

This was fundamentally different from the Greek theatre, which had developed impossible spaces setting it apart from the physical spaces of real architecture and everyday life. In the Franciscan movement, the story of life became a direct extension of the story of Christ and the narrative space in Christ's story could, and implicitly had to be extended into the space of real life. As Christian artists of the latter Middle Ages explored this narrative space, these connections with physical space became ever more explicit until the possibility, even the necessity of matching pictorial and physical space became explicit also.

Both primitive connecting and Greek imitating had been constrained by magical and ideal considerations, which acted as filters limiting art to universals of invisible and verbal worlds. The new concept of matching opened the horizons of artistic representation to the particulars of the visible world, which expanded even more through the prospect of varying.

Varying

In the case of the *Annunciation*, this process of varying had begun even before the rules of perspective had been formally established, as is evidenced by Pietro Cavallini's *Annunciation* (Rome, Santa Maria in Trastevere), or Ambrogio Lorenzetti's version (Siena, Accademia, 1344), generally accepted to be the first painting in which all the lines of the tiles converged to a single vanishing point. After Alberti's first treatise on perspective (1434), and particularly after the advent of printing in the 1450s, variation increased in scale. Some examples, such as the unknown fifteenth century painter in Santa Maria Novella, continued to produce rough empirical versions. Fra Angelico produced several variants using an open colonnaded space (e.g. Madrid, Prado), thus developing a form used earlier by Nicolo di Pietro Gerini (New Haven, Yale University Collection, 1375); or another with a portico opening into a garden (Florence, San Marco), a theme which Domenico Veneziano (Cambridge, Fitzwilliam) also explored. Sometimes the scene was inside on a regular pavement, as in the anonymous *Annunciation* in the Gardner Collection. Sometimes it was outside on such a pavement, as in the version by Francesco di Giorgio and Naroccio di Landini in the Yale Collection. At other times it was outside in a green garden as in the versions by Filippo Lippi (London, National Gallery) and Leonardo da Vinci (Florence, Uffizi).

Crivelli, by contrast, developed a spatial example from Bellini's *Sketchbook* in his *Annunciation* (London, National Gallery), which was at once symbolic of Christ's coming and at the same time a record of a papal grant by Innocent III to the citizens of Ascoli Piceno concerning certain rights in self government, which reached the town on the feast of the Annunciation, 25 March 1492. He thus combined information from a biblical text, a sketchbook and historical record. More complex textual sources called for a more complex picture, which required complex spatial arrangements made possible by perspective.

Any attempt at classifying the full range of variants on the *Annunciation* would be a large book in itself. For our purposes it will suffice to note how every region developed its own variants on a subject. In Florence, *Annunciations* inside homes were the exception (e.g. Pollaiuolo's version in Berlin, Staatliche Museum). By contrast, Flemish versions were normally indoors: sometimes in living rooms, as in Robert Campin's version in the Metropolitan, sometimes in bedrooms, as in Rogier van der Weyden's version in Munich, Alte Pinakothek, or in the apses of churches, as in Jan van Eyck's version in Berlin, Staatliche Museum. In Germany, *Annunciations* were also frequently in bedrooms, as in Dürer's woodcut, and in churches as in Grünewald's Isenheim Altar (Colmar, Musée d'Unterlinden, 1510-1515), but with very different uses of space. Meanwhile, other Flemish versions had combined elements of the living room, bedroom and church interior in a single, rather unlikely space as, for instance, in the *Annunciation* attributed to Henri met de Bles (Cambridge, Fitzwilliam Museum). Variants of this composite spatial arrangement became popular in Spain as witnessed by Alejo Fernandez' version (Seville, Museo de Bellas Artes) or in Berregete's *Annunciation* (Burgos, Cartuja de Miraflores).

This tradition of using perspective to create unexpected variants of a familiar theme was further developed in the seventeenth century, by which time varying went hand in hand with explorations of scale. In the case of Saenredam, for instance, nine of the eighteen construction drawings for his famous interiors involved a single church, St. Bavo, in Haarlem, which was further studied by De Witte, while Berckheyde depicted its exterior from different points of view.

In terms of narrative, varying had a two edged effect on the story-telling process. On the one hand, it made a theme such as the *Annunciation* immensely rich in its many representations. On the other hand, in focussing so much attention on a key theme, it undermined, and even prevented interest in other elements of the story. Perspective which grew out of narrative thus posed a threat to a story's continuity. This was not only due to varying. It was caused also by a second feature of perspective, which we shall term emphasizing.

Emphasizing

Perspective emphasized scenes in particular ways. It exaggerated the geometry of the man-made environment, thereby drawing a viewer's eye into a spatial scene, while at the same time reducing individual figures therein to a diminutive size. This was no problem in the case of idealized cities such as the Urbino, Berlin or Baltimore panels, but proved inconvenient in a Christian tradition, which focussed on Christ, Mary and various saints. A compromise thus ensued. Individual figures continued to dominate the main panels while perspectival scenes relating to their lives were relegated to the predellas. Once the laws of perspective began to be understood in the 1430s, artists gradually discovered means of keeping figures in the foreground of perspectival settings. Domenico Veneziano's *Annunciation* (Cambridge, Fitzwilliam) was an early example. Piero della Francesca's *Flagellation* (Urbino, Galleria Nazionale dell Marche, c. 1460-1470) marked an important next step leading to the most famous cases of the high Renaissance: Leonardo's *Last Supper* (Milan, Santa Maria delle Grazie, c. 1495-1497) and Raphael's *School of Athens* (Vatican, Stanze, 1510-1515).

In cases such as the *Last Supper*, there were psychological factors which combined to augment this process of emphasizing. Just as in portraits where eyes looking out of the picture continue to follow a viewer as they move to the side, perspectival pictures with alleys, corridors, rooms or any regular spatial features also follow a viewer as they move to the side.³⁸ For this reason we can look at perspectival settings in theatres and movies, which are an extension of perspectival principles, from a number of seats. Michael Kubovy, who has recently explored this phenomenon, has termed this the robustness of perspective.³⁹

Artists such as Leonardo obviously realized that the *Last Supper* would work even though its vanishing point was at a height above that of any ordinary observer. Indeed, precisely because it could be looked at without undue distortion from anywhere within the refectory of Santa Maria delle Grazie, was a major reason why it was worth emphasizing this painting to the exclusion of others. The same applied in the case of

Bramante's fictive arch in Santa Maria presso San Satiro in Milan, and Tullio Lombardo's scenes from the *Life of St. Mark* in Venice. The fictive depth involved might be small, as in Piero della Francesca's *Brera altar*, or large, as in Masolino's version of *Herod's palace* at Castiglione d'Olona. The effects remained the same. And, as in the case of the varying function, the emphasizing function of perspective focussed attention on key episodes of a narrative thus serving also to undermine the continuity of a story. Yet a third factor contributed to this process.

Relating

In representing a story with many episodes painters were faced with a problem of individuating scenes. Frames were of some help, but these could not give many clues concerning the order in which scenes were to be read. Here perspectival treatment of certain features helped to relate scenes while at the same time separating them. The problem is clearly evident in Duccio's *Maestà* (Siena, Museo del Duomo, 1288), if we consider it in more detail. On the reverse side of the altar, the story begins in the bottom left hand corner with Christ's entry into Jerusalem, moves in an up-down sequence towards the right, then returns to the upper left hand corner again criss-crossing its way to the far right. Three scenes with Christ and his Apostles (*Washing of the Feet*, *Last Supper and Meeting with Apostles*) all share one type of spatial interior with beams of the ceiling converging towards a central axis. Three scenes with Caiphaz and the priests occur in an interior with a type of oblique parallel projection. A similar oblique parallel method applied to an awning supported by columns connects scenes with Pontius Pilate in the bottom right and top left. These proto-perspectival elements thus relate separate scenes and help us to follow their sequence.

In the *Scrovegni Chapel* at Padua (1304-1307), Giotto uses the same principle. An oblique view of an open fronted house serves for both the *Annunciation to Saint Anne* and the *Birth of the Virgin*. Similarly, a temple with a niche serves as a continuation between three scenes: the *Ceremony of the Rods*, *Prayer for the Miracle of the Rods* and *Marriage of the Virgin*. This function of relating separate scenes in a complex narrative explains why a few proto-perspectival elements became stock images, which improved empirically, while other architectural elements remained spatially awkward and unconvincing. And as we noted earlier it was precisely these stock images which were consolidated and standardized by the early perspective treatises.

Relating took on many forms. In his *Profanation of the Host* (Urbino, Galleria Nazionale delle Marche), Paolo Uccello used two vanishing points going in different directions in order both to separate and relate the two scenes. The same principle was used in the Munich manuscript of Boccaccio, in the organization of the Teatro Olimpico at Vincenza and in the gardens at Versailles. Hence scenes with different vanishing points could be implicitly related by means of perspective. Scenes physically separated from one another were also explicitly related by means of a single vanishing point. Giotto's *Annunciation* in the *Scrovegni Chapel* in Padua (1304-1306) was an early attempt in this direction. Masaccio--and Masolino?--developed this idea in the *Annunciation* in San Clemente in Rome, while Foppa used it dramatically in his *Annunciation* in S. Eustorgio in Milan.⁴⁰

Nor was the principle limited to *Annunciation* scenes. Parronchi has suggested that Ghiberti used it on the doors of the Baptistery at Florence⁴¹ and has shown convincingly that Masaccio employed it in relating the *Distribution of the Goods with Saint Peter Curing the Sick* in the Brancacci Chapel (Florence, Santa Croce, 1426-1427).⁴² Once familiar, the method was used in more subtle ways. Spatially analogous scenes were related without their sharing a common vanishing point as, for instance, in Piero della Francesca's *Annunciation* and *Dream of Constantine* in Arezzo.

Raphael developed these principles of relating in his famous juxtapositions of sacred and profane scenes in the *Stanze*. Here the situation was complicated by typological and symbolic considerations. The mediaeval period had seen an increasing fascination with parallels between the old and new testaments with minor references to relevant pagan figures such as the sibyls. This inspired the ceiling at Hildesheim in the eleventh and the great rose windows at Chartres, Paris and York in the thirteenth century. In the next centuries the pagan element⁴³ gained in significance to the point that Raphael in the *Stanze* was challenged with finding parallels between Christian and Antique themes such as the *Church Fathers* versus the *School of Athens*. In these and other great cycles it was no longer a question of telling complete stories, but rather of choosing key episodes in stories which could be balanced by others.⁴⁴

Hence all three basic functions (varying, emphasizing and relating), which made perspective so powerful, had the same effects. While focussing attention on key episodes in a narrative, they simultaneously undermined the continuity of the story telling process. Indeed as perspective provided more complex frameworks for the organization and comprehension of such scenes, their narrative order became less significant and sometimes disappeared. This helps to explain what would otherwise be two contradictory trends in the history of narrative cycles from the time of the Bayeux Tapestry (Bayeux, Town Hall, 1073-1083) and the mosaics at Monreale (1182), to the frescoes of Giotto in the Scrovegni Chapel (1304-1306) and Raphael in the *Stanze* (1507-1513). As the treatment of space improved, the number of scenes diminished. Monreale had 167, the Scrovegni had 53, the Sistine Chapel had 23 scenes. The sequential order of the story telling process also decreased in clarity. To attain a deeper understanding of these phenomena requires examination of contexts and frames.

Contexts

Perspective brought with it a tendency to reduce a number of independent episodes and include these with a single spatial context, as is strikingly illustrated in Memling's *Seven Joys of Mary* (Munich, Alte Pinakothek, c. 1480), which integrated no less than seventeen episodes beginning with the *Annunciation* and ending with the *Assumption of the Virgin*. Similarly, in his *Treatise of Painting*, Leonardo recommended that one: “ must place the first plane at the eye level of the beholder of the scene and on that plane represent the first scene in large size and then, diminishing the figures and buildings on various planes, as you go on, make the setting for the whole story.”⁴⁵

These tendencies towards a single spatial context containing several temporal episodes are of particular interest because they call into question the oppositions between painting and poetry articulated by Lessing. In his *Laokoon*, he suggested that painting and poetry used completely different means and signs in achieving imitation; that painting used figures and colours in space, while poetry used tones in time.⁴⁶ Lessing elaborated on these basic oppositions. Painting, he claimed, was concerned with bodies, poetry with actions;⁴⁷ painting with a totality, poetry with parts;⁴⁸ painting with space, poetry with time.⁴⁹ It is instructive that his examples drew constantly on Greek art and poetry and indeed might hold if restricted to a comparison between Greek sculpture and poetry. But they do not hold for the whole of art. Indeed, the many scenes integrated into a single spatial context as practiced by Memling, and recommended by Leonardo, show that perspective removed these oppositions and introduced different actions of a body, different parts in a whole and different times in a single space as important new dimensions of representation, which take us directly to some of the richest aspects of art in and since the Renaissance.

For instance, the first of these, the ability to represent different actions of bodies prompted Leonardo to make a list of eighteen basic actions which could be painted⁵⁰ and led him to explore kinematic sequences of men at work and play, a principle which has since inspired the development of motion pictures, television and video. The ability to represent different parts in a whole was equally fundamental in its consequences. For it explains why photographic details of Renaissance paintings can function as if they were photographs of complete paintings. This principle also makes possible the game of imposing imaginary frames in galleries and observing how each of these functions as independent pictures. Art dealers, who sawed off sections of old masters, and then sold these whole-sale were, of course, taking the game a bit too far.

The principle, which makes these games possible, is intimately connected with problems of particulars and universals. A perspectival painting, i.e., a painting which has a context, is based on particulars, is comprised of individual features and has the astounding feature that its "parts" also function as wholes. Nature has this same feature which is why we can take any scene, add different lenses to our concern and each time come up with an independent picture. Note the connection between particulars, individuals and independence. Note that these are also a key to creating new frames, focussing on details and changing scales which are three ways of describing this open process.

It is rather important to realize that none of this is possible as long as universals govern representation, as tended to be the case in Greece. Given universals, the goal of representation is perfection, literally putting an end to, a totality, a perfect totality. To remove any part of a totality is to destroy its perfection and to remove its aesthetic potential. (Or at least in theory, although some art historians will assure us that gods and goddesses are aesthetically the richer through amputation of arms, legs and other parts.) Hence a commitment to universals generates only parts dependent on a totality, which remain impersonal, static and without a temporal dimension. By contrast, a commitment to particulars leads to individuals independent of the whole, which can be personal, dynamic and with a temporal dimension. Because universals limit attention to the

perfection of a totality, any change of frames would leave out some important part of that totality; any focus on a detail would leave the totality out of focus and any change of scale would make no difference: which is why photographs or slides of a three inch statuette or a six foot classical statue sometimes produce exactly the same effect. When the emphasis is on totality there is no context and no way of inferring scale. Indeed universals, with their commitment to perfection, produced an approach to representation which effectively denied the importance of size, scale, context, frames and time, i.e., precisely those features which perspective made the central concerns of Renaissance art and science.

Mention of time brings us to the third of Lessing's oppositions, which we need to consider briefly before returning to the connections between perspective and frames. Lessing's claim that poetry dealt with time, while painting dealt with space overlooked the ways in which perspective introduced spatio-temporal dimensions into painting. The most obvious examples involved episodes in the lives of saints as in the Memling painting mentioned above. But there were also much more subtle examples as in Carpaccio's *St. George and the Dragon* in the cycle devoted to that saint (Venice, Scuola di San Giorgio).

In the foreground of the painting, just left of centre, we see a scene with a snake looking at a toad which looks in turn at a lizard. In a second scene, further back, we do not see the toad, while the lizard looks at the decomposing body of a woman obscuring most of the snake except for its tail, which forms an unexpected necklace for the corpse. In scene three, the toad reappears just right of the centre near the corpse of a man while the snake lurks beneath the corpse's left foot. In scene four, the snake devours the toad, while the lizard looks on. The subject may be unappetizing, but it suggests that Lessing's claims about time, parts and actions in painting were undigested.

There were other subtle ways in which spatio-temporal dimensions came into play. As we have shown the matching function led to a natural extension of the represented space of the painting into the physical space of the environment where it was painted. Hence, as was noted elsewhere, local townscapes inevitably entered as backgrounds in religious paintings. As these background townscapes became more pronounced they brought into focus unexpected anachronisms, for events in the life of Christ which had occurred fourteen or fifteen centuries earlier now stood in the foreground of a contemporary scene. By the late fifteenth century, when Ghirlandaio did his cycle on the life of Saint Francis (Florence, Sassetti Chapel, 1483-1486), he depicted the saint literally in the squares and streets of Florence. Here, of course, the anachronism involved, only a few centuries but even so Ghirlandaio did nothing to remove it.

Perhaps there were problems in learning to see spatio-temporal dimensions in paintings, just as it took a long time before painters became aware of problems of shadows caused by the sun at different times of day in their landscapes. We might have expected the writings of Machiavelli, Guicciardini and other historians to introduce a greater historical consciousness, which would remove such anachronisms. Instead, the anachronisms persisted throughout the seventeenth, eighteenth and into the nineteenth centuries, until

first the camera, and then the impressionists focussed attention on scenes limited to a specific place and time: Paris on a rainy afternoon, Arles on a sunny morning, etc. But long before this the anachronisms had taken on a subtler form. For as the contemporary background slowly moved forward to dominate even the foreground, the historical event retreated quietly into the background. By the mid seventeenth century with Claude we (almost) need to be told that the four figures standing in a landscape involve the story of *Jacob and Laban* (London, Dulwich Art Gallery); a principle that applies equally to mythological scenes such as his *Coastal landscape with Apollo and the Cumean sibyl* (Private collection, 1665).

These shifts introduced by perspective deserve much more attention. For it is usually assumed that the development of secular art was largely due to a rejection of the religious tradition. We are suggesting that the reverse was true: that it was paradoxically the Christian tradition of creatural realism that combined with perspective to create frameworks for matching which extended biblical narrative into the physical world and made nature first a background topic and gradually a dominant theme in the history of representation. We have shown how contradictions between and combinations of spatial and temporal dimensions played a central role in these developments. And Lessing's desire to maintain the simple polarities of painting-space versus poetry-time led him to overlook this, and indeed other fundamental contributions of Renaissance art.

Frames

To understand this properly we need to return to the problem of frames. For the whole phenomenon we have been describing of townscapes slowly coming into the foregrounds of religious paintings is very much a question of frames and fully analogous to a zoom lens which focusses on what had been a background detail, frames it and then increases its scale until it dominates the entire scene. Which is also why perspectival representation leads ineluctably towards a photographic image, where framing is almost the name of the game. We shall show that these connections between a play of perspective and frames go back at least to the time of Giotto in the Scrovegni Chapel at Padua (1304-106), but before doing so we need to refine an earlier claim.

We have stressed that perspective applies not only to painting but to other arts such as architecture and sculpture involving various media including bronze, marble and wood. However, in another sense, perspective has special applications to painting because in this medium it imitates effects also produced by sculpture and architecture, and for this reason, Chastel,⁵¹ has justifiably opposed (painted) perspective to sculpture and architecture, or perhaps more accurately, painted perspective vies and equivocates with effects which sculpture and architecture create, thus encroaching upon and/or playing with the frames they impose or suggest.

This did not always happen. In the case of altars, for instance, it played only a small role. As Heydenryk, in his history of frames has noted, Italian altarpieces imitated architectural features and effectively became cross sections of Gothic churches,⁵² while in the North "the elements of a frame were invariably emulations of architectural elements but no

effort was made to create a logical architectural structure as had been done in Italy."⁵³ The advent of perspective affected the contents of altars and meant that various ornamental patterns on their frames, which had previously been sculpted, were now painted. But it had little substantive impact on the function of altar frames. By contrast, in the case of frames in the fresco cycles,⁵⁴ perspective had an enormous impact.

In the *Scrovegni Chapel* at Padua, Giotto explored the potentials of using proto-perspectival effects to replace, or rather match architectural structures in his concealed chapels or coretti on the east wall. But while there was play of boundaries between architecture and painted architecture, there was effectively none between architecture and painted narrative, where each scene was neatly separated from the next by clear cut frames. Giotto experimented with both problems separately in the same building. The early Renaissance pursued both experiments, discovered and formalized the perspectival principles underlying them. The high Renaissance integrated the two experiments into a new synthesis as becomes clear if we turn to Michelangelo's *Sistine Ceiling* (1505-1508).

As in the Scrovegni Chapel, there is a narrative cycle. But whereas Giotto's scenes maintained a certain uniformity in size, Michelangelo plays with their scale. In the central portion four large scenes alternate with five smaller ones which are flanked, in turn, by ten medallion-like scenes. In the corners there are four further scenes making a total of twenty-three episodes from the *Old Testament*. Then there are the forebears of Christ in the triangular niches and in the semi-circular niches below these. But the complexity of the *Sistine Ceiling* begins, in a sense, with the six sibyls alternating with six prophets in painted architectural cubicles enclosed by column-like painted sculptures and topped by painted nudes.

The cubicles function as if they were part of a wall, the orientation of which keeps changing as we move through the chapel and constantly contradicts, or rather plays with the curvature of the actual ceiling. The nude figures seated on top of the columns require us to read the surface three dimensionally, while we remain aware of the ceiling as a flat surface. If we look higher than the nudes our eyes are drawn into an orientation 90 degrees to the side, and if we look higher still, we need to shift our orientation a total of 180 degrees if we are not to read the second set of nudes as falling down.

Perspective continues to play a role in the actual scenes, as in the dramatic positioning of Haman on the cross. But its main function is now in the spaces between scenes, in, with, amongst the frames, provoking a complex interplay between painted, painted sculptural and painted architectural elements which, while continuing to separate the scenes, also integrate them into a new kind of systematic whole. Perspective now creates spatial illusions only seemingly to subvert them, playing with and on them to increase the potential for polyvalent readings of different scenes theoretically separated yet, systematically related. These polyvalent readings are encouraged by the nudes and other figures whose arms and feet continually reach and step into the neighbouring spaces. At the same time they are held in check by the painted architectural features which maintain some clear linear boundaries between the scenes.

The mannerist period worried less about keeping these boundaries fixed. Already in the Gallery of Francis I at Fontainebleau, boundaries between painted, painted sculptural and painted architectural spaces were rendered more ambiguous a) by increasing the extent to which figures reach out beyond their given frame into adjacent spaces and b) by deliberate introduction of actual sculptural and architectural elements which overlap with their painted equivalents. This encroachment of figures and overlapping of art forms and media went ever further until it became difficult and ultimately impossible to know where one stops and the other begins. Hence if the high Renaissance discovered frames and their media as realms of perspective, Mannerism used perspective to play with frameworks, anamorphically distorting them in the process. Baroque art went further, playing with the whole distinction between the forms of frames and their contents. By the late seventeenth century, as Baroque art moved towards Rococo, the actual architectural spaces were manipulated and integrated in order to intensify this playful destruction of distinctions between frames and paintings, between form and content.

The experiments had begun with Giotto's concealed chapels, which played with distinctions between painted and real architecture. By the 1580's this play between painted and architectural reality had become a major challenge for masters of perspective, particularly in terms of *di sotto in su* paintings, which involved illusionistic ceilings such as that of Scamozzi and Sansovino in the Marciana library in Venice. This soon found published equivalents in treatises ranging from a single illustration in Danti's commentary (1583), to the 75 examples in a now almost forgotten collection by Has, which appeared in the same year (1583), which provided a context for Pozzo's illusionism in *Il Gesù* (1691-1694) and also prefigured uncannily the twentieth century work of Escher.

Such examples bear witness to an extraordinary shift in the applications of perspective, from the content of paintings to their form. For we have shown that perspective had basic consequences for both the spaces in paintings and the spaces of the frames between paintings. The first of these concerns led to shifts from isolated objects to scenes in context, to scenes in the context of a secular background and to secular scenes in a specific place and time and ultimately to new distinctions between these realistic spatio-temporal scenes and other more symbolic ones, where time and sometimes even space were not factors. Meanwhile, the second of these concerns began with the varying, emphasizing and relating functions of perspective, led Renaissance artists to discover connections between perspective and the framing process, and to focus attention on the spatial forms of containers of paintings. As they did so, attention to the contents within the containers dwindled or rather it shifted from narrative episodes to symbolic moments in the narrative which, in the next generations were reduced to symbols almost without moment until, finally, the capacities of perspective were focussed on form without content.

Together these two developments transformed the whole of representation. They removed the oppositions between bodies and actions, totality and parts, space and time, which Lessing had seen as separating painting and poetry. Indeed they revealed the limitations of Greek concepts of perfection and introduced new horizons of aesthetics in terms of size, scale, focus and frameworks.

All this was only the beginning. By the mid-sixteenth century perspective had spread beyond the spaces of paintings and their frames, outside the buildings that contained them into the streets and gardens. In the seventeenth century perspective gradually transformed the use of physical space partly so that this too could be rendered more perspectively, a process of transformation which gradually spread to the whole environment. In the next sections we shall show how perspective also transformed the landscapes of the mind cultivating new concepts of freedom and imagination, inspiring new developments in art which still continue.

Aesthetic Distance

As for the underlying reasons for this process, the cultural dimensions, we understand these more clearly when the development of art as visual metaphor is seen in relation to literacy and levels of aesthetic distance. In primitive societies, when connecting was the goal of art and there were no texts, a statue was a god. It presented rather than represented, such that art asserted the equivalence of god and image. In Greco-Roman culture, as imitation became a goal of art, and as isolated manuscripts recorded the names, characteristics and deeds of the gods, the function of statues changed from presentation to representation, such that what had functioned as equivalents, now functioned as substitutes of the original. As the use of texts spread from descriptions of divinity to include learned interpretations thereof, the thinker Euhemerus suggested that statues and paintings represented men as if they were gods. This theory of Euhemerism, named after him, thus introduced a new level of distance between original and image.⁵⁵

The rise of Christianity, with its focus on the *Bible*, meant that the images in this text could be cited or even be alluded to indirectly.⁵⁶ A statue or a painting could now represent *a* but mean *b*: it could, for example, show a good shepherd and mean Christ. Symbolism thus introduced a further level of distance between original and image.

The Renaissance may well have been inspired by Antiquity, but perspective challenged it to go in fundamentally new directions. Perspective introduced a visual standard for checking quantitatively to what extent a match was involved between an individual object or context and its representation. Matches were now testable. If this transformed the nature of representation, it also transformed the nature of illusion. Giotto's illusionistic paintings of concealed chapels in the Scrovegni Chapel offer an early case in point. Unlike the impossible scenes of the Greek stage, this is possible architecture: a physical construction, which could readily exist. So we check and discover that the chapels are not real architecture. The paintings thus make visual statements that something is, assuming we will know that it is not. As such they function as visual metaphors.

Whereas Greek illusions were based on universal concepts, Renaissance illusions were based on particular elements: Giotto's chapel, Bramante's choir, Pozzo's cupola, each of which could be tested in terms of a one to one match. As a result, while Greek illusions were designed to deceive the eye, Renaissance illusions were planned for us to see through them, thus transforming the very concept of illusion from a negative trick to a

positive game: challenging us to look more closely, to play with change in focus, scale, and framework; teaching us to expand our sense of what is and what is possible rather than trying to limit these as had Aristotle and Vitruvius.

These links between perspective and visual metaphor deserve closer attention. The development of perspective involved ever closer matches between object and representation, resulting in more realistic representation, and an ever finer play on the distinction is - is not, which lies at the heart of visual metaphor. When perspective is at its best, the distinction is-is not is at its height. This intimate connection between the rise of perspective and visual metaphor is important for at least two reasons. First, it suggests that perspective transformed the very meaning of metaphor: from a general comparison without a specific match, to a particular comparison with a -potentially- specific match, from a verbal concept to a visual metaphor. Secondly, perspective changed its function. In Aristotle's scheme, metaphor remained an ornamental frill with respect to the structure of language, an extra of no real importance.⁵⁷ Perspective implicitly made metaphor central to the whole aesthetic experience, for now the effect of a painting turned on how well it could play upon the distinction is - is not.

In Padua, Giotto explored these problems in terms of painting (1304-1306). In Verona, a decade later Dante explored them in terms of language with respect to sculpture, when he wrote in his *Divine Comedy* (c. 1314) of the angel that:

 Appeared to us, with such a lively ease
 Carved, and so gracious there in act to move,
 It seemed not one of your dumb images,

 You'd swear an Ave from his lips breathed off,
 For she was shown there too, who turned the key
 To unlock the treasure of the most high dove;

 And in her mien those words stood plain to see:
 Ecce ancilla Dei, stamped by art.
 Express as any seal on wax could be.⁵⁸

Dante went on to describe pictured smoke,⁵⁹ stories in stone narrated,⁶⁰ complete with visible speech.⁶¹ We must at this point resist the temptation of a Dante commentary and only mention in passing that there are clearly parallels between these developments in literary narrative and those in pictorial narrative considered above. It is of interest that literary historians of the period have provided a more ample context for understanding Auerbach's concept of creatural realism arising out of the Judaeo-Christian biblical tradition. Indeed, they now speak of a development of perspective in literature: in terms of stories based on individuals in specific times and places, rather than eternal heroes in universal landscapes.⁶² We have seen pictorial parallels, as the townscapes of Florence and other towns entered into the backgrounds of paintings showing the lives of Christ and the saints.

Date	Process	Term
-1000	statue equals god	equivalence
1000-200 B.C.	statue represents god	substitution
200-300 A.D.	statue, painting represents man as if god	euhemerism
300-1200	statue, painting represents <i>a</i> but means <i>b</i>	symbolism
1200-1450	painting represents <i>a</i> and means <i>a</i>	literal
“ “	O.T. and means N.T.	allegorical
“ “	Christ's actions in relation to man	moral
“ “	Christ's actions in relation to Eternity	anagogical
1450-1560	painting represents <i>a</i> in guise of <i>aI</i>	(allegorical)
1650-1800	painting represents <i>a</i> in playful guise of <i>aI</i>	(caricature) ⁶³

Figure 4. Links between art and levels of abstraction.

It is important to note that the problem of visual metaphor, which plays on the is-is not distinction, involves both spatial and temporal dimensions. To continue with our Florentine example, at a spatial level the distinction plays on whether this is Florence or is not Florence (i.e. only a representation of Florence). The more difficult it is to make this spatial distinction, the more necessary it becomes to make a temporal one: i.e. the more we are convinced that this is actually Florence in the background, the more we have to insist that although this be a contemporary scene, the story in it is not. To put it differently, the more realistically we paint the space of a religious story, the more allegorically we need to see its contents if we are not to fall into crass anachronism. Use of visual metaphor in space thus leads to use of visual allegory in time. Two years after Giotto painted the Scrovegni Chapel (1304-1305) in Padua, Dante in his *Convivio* (1307), distinguished between literal and allegorical as well as moral and anagogical senses.⁶⁴ Such parallels suggest new fields of study: exploring the extent to which the development of visual metaphor in painting went hand in hand with a growing importance of metaphor in language to a point where, in the United States, there is even discussion of metaphors we live by.⁶⁵

The development of textual communities⁶⁶ led to refinement of these principles in the form, as we have seen, of Dante's distinction between four levels of interpretation: literal, allegorical, moral and anagogical. The advent of printing expanded the range of books common to textual communities, and what had begun as parallels between *Old* and *New Testaments*, were extended to relate pagan and Christian themes, as in the *Sistine Ceiling* and the *Stanze*.

The spread of printing went hand in hand with more subtle levels of literary and visual interpretation. Mediaeval symbolism had involved representing *a* while meaning *b* (the good shepherd meaning Christ), with the assumption that one believed in the reality of both *a* and *b*. The Renaissance introduced a play element into this formula: a painting now represented *a* in the guise of *aI* without requiring that one actually believed in *aI*. Honthorst's painting of the *Princess of Orange as Diana* (Utrecht, Centraal Museum,

1643), offers a case in point. At one level, it is a portrait of Louise Henriette of Nassau, Princess of Orange. At another level we recognize the dogs, bow and arrows as attributes of Diana, through literary culture. So we see the princess playing the part of Diana without needing to believe literally in the pagan goddess or her powers.

The increasing tendency to push topics into the backgrounds of landscapes in the seventeenth century, as in the case of Claude considered above (p. 18), increased distance in two senses. When subsequent mythological figures stayed in the foreground, the play element was frequently extended to their attributes to indicate that one was not expected to believe in them, as in Boucher's *Venus, Mercury and Amor* (Berlin, Schloss Charlottenburg, 1742). We recognize the man as Mercury by his winged feet. But the wings have been tied on with a ribbon, to help us see through his guise, and to leave no doubt that this is a Frenchman playing the part of a god. Sir Peter Lely went further still in his *Nell Gwynn and the Duke of St. Alban's as Venus and Cupid* (Chiddingstone Castle), where he relied on the topos of a reclining female nude with standing child without attributes to indicate Venus and Cupid, and by making these figures portraits of two well known and notorious personalities, he transformed a purportedly classical scene into a social statement about a contemporary relationship.

Since then there have been many further developments: Salvador Dali's treatment of Millet's *Angelus* comes to mind.⁶⁷ However, a detailed map of all these levels of distance is not our concern here. We are interested rather in pointing to the larger context of perspective: that there were important connections between literacy, more complex uses of space, and more subtle levels of interpretation; that perspective, which on the surface involved literal realism, played an important role in associating art with levels beyond the literal. Perspective and symbolism went hand in hand. Perspectival realism made it possible, for instance, to represent Roman soldiers in Turkish costumes in Renaissance versions of the Crucifixion, such that this scene reflected both an historical event and contemporary religious problems. Instead of pinning the image down, perspective made it polyvalent, and if it made serious matching possible, perspective also introduced playful matching. Hence instead of dooming art to a closed system of copying, perspective transformed it into a creative act, open to new themes and new goals.

New Functions of Art

Thus far we have considered four goals of art: connecting, ordering, imitating and matching, and with respect to the latter have focussed on matching the visual world illustrating implicit common verbal sources, such as the *Bible*, which were so well known that knowledge of their stories could be taken for granted. Perspective had its greatest impact in visualizing such texts. Nonetheless, there were no less than nine other types of matching and two other goals of art, mixing and exploring, which require brief mention, even if detailed consideration thereof is beyond the scope of this introduction.

Matching

The most obvious type of matching, involving a simple record of the visual world, was implicit in Brunelleschi's first experiment involving the Baptistery. It became more common, as use of the window principle was extended from individual objects to views of towns and landscapes. Perhaps because it was so obvious, this type of art remained of less interest to art than the military until the advent of the camera, which effectively mechanized the perspectival window principle, awakened new interest in its creative potential.⁶⁸ Matching could also involve illustrating a text directly, an approach which was applied to the *Bible*, classical authors such as Ovid, mediaeval literature such as Boccaccio cited earlier, and chronicles such as Froissart (e.g. B.M. Harley 4380, fol. 23b). Thirdly, matching was used to illustrate recurring events, particularly the four seasons and topoi, which could be based on classical sources, such as the three graces, or be of a more general character: old age, the fool, the land of cockaigne, etc.

In some cases, matching involved an implicit verbal source, which was either so uncommon that most persons would not recognize it, (or alternatively so common that everyone at the time took its meaning for granted and we in retrospect find it mysterious). Three famous examples immediately come to mind: Botticelli's *Primavera*,⁶⁹ Giorgione's *Tempest*⁷⁰ and Bronzino's *Allegory*⁷¹ (London, National Gallery). In other cases, matching involved well known verbal sources, which remained difficult to recognize because the scene was set as a part of every day life or in the background of a landscape. In early examples, such as Carpaccio's *Calling of St. Matthew* (Venice, Scuola di San Giorgio degli Schiavoni, 1525-1526), where Matthew was shown simply as a tax-collector, the surrounding pictures provided a context for understanding its meaning. In Caravaggio's treatment of the same theme (Rome, San Luigi dei Francesi, Contarelli Chapel, 1597-1598), only a ray of light revealed that this was a sacred rather than a secular scene. By the time of Tenier's *Seven acts of mercy* (Dulwich, Picture Gallery), we need to recognize that passing a loaf of bread is a visual metaphor for feeding the poor. We need even more discerning to recognize classical scenes set in the context of landscapes, as in the paintings of Claude Lorrain.

The twentieth century has shown a fascination for treating the matching function in a playful and/or ironic manner, as, for instance, in Magritte's *Treachery of Images* (New York, Private Collection, 1928-1929), which shows a meticulously painted briar pipe with the caption: This is not a pipe. Magritte's *Promenades of Euclid* (Minneapolis, Institute of Arts, 1955), offers a more subtle example by demonstrating how a flat road going into the distance and a three dimensional tower both project triangular shapes on a perspectival window. Some of Escher's work might also be mentioned in this context, although he is more complex in that he has different perspectival viewpoints for separate parts of a picture, which are then carefully integrated to function as a single context (e.g. pl. 73.4). There have, in fact, been a number of movements which have played with the matching principle mainly by overemphasizing certain aspects of reality, including the Precisionists, (e.g. Charles Demuth, Ralston Crawford); Pop Art (Richard Hamilton, Edward Ruscke); New Realism (Mel Ramos) and Photo Realism (Richard Ester, Ralph Goings, Chuck Close).⁷² In all of these movements, perspective continues to play a

central role. The revival of interest in *trompe l'oeil* is another manifestation of this play with matching principles as, for instance, at the American embassy in Paris (pl. 100). Here the oblique walls are carefully painted illusions, with doors that reveal clouds beyond. The left wall, itself a *trompe l'oeil*, opens into a *trompe l'oeil* of the second degree, showing a colonnaded arcade. In front of this stands a *trompe l'oeil* officer representing a country which until recently had a former actor as its president.

Anamorphosis was an unlikely form of matching, which involved distorting shapes in such a way that, when seen from a specific viewpoint, their original form returned. This alternative, developed by Piero della Francesca, received particular attention in the seventeenth century, and was then ignored until an historical study by Baltrusaitis (1956) inspired new interest therein.⁷³ Meanwhile, the twentieth century has introduced another kind of matching involving distortions: it abandons a rigid geometry of straight lines, involves a simplification of spatial features, yet nonetheless remains committed to representing familiar objects in every day life. Sometimes, as in Henri Matisse's painting of *A Girl Reading* (Edinburgh, Scottish National Gallery of Modern Art, 1919), the results are close to those of parallel perspective. At other times the departure from Renaissance perspective is striking: as in Picasso's *Woman Reading* (Paris, Musées Nationaux, 1935).

The twentieth century has introduced yet another type of matching involving occlusion. Renaissance painting had concentrated on the opening function of perspective, treating the picture as a window into a world beyond. By contrast, the occluding function concentrates attention on the picture as a surface. The opening function had led painting to match architectural and sculptural effects. Yet, even when painting created effects indistinguishable from those of architecture and sculpture, it ironically upheld an underlying assumption that the three media were distinct from one another. The occluding function of perspective, which emphasized painting as surface, meant that painting was no longer a medium which could match the effects of the other two, such that painting, architecture and sculpture now emerged as equals, and what had been a focus on pictorial space, shifted to a new interplay of pictorial with physical sculptural and architectural space. One reflection of this basic change in orientation was a trend of important painters, who also practiced sculpture: including Daumier, Gauguin, Degas, Renoir, Bonnard, Picasso, Matisse, Modigliano, Braque, Derain and Leger.⁷⁴

Aspects of cubism were also linked with this change in orientation, which emphasized occlusion rather than transparency, and which relied on perspective more than might be expected. Gleizes, for example, in his basic work *On Cubism* (1921) retained respect for perspective: "In the beginning the framework created the perspectival principles was robust, but it was reversed by the follies of realism, and it was impressionism which threw itself hopelessly into atmospheric inconsistencies."⁷⁵

In his chapter on realism Gleizes admitted: "If an artist whose specialty is in painting still life academically suddenly renounced all his favourite subjects for subjects composed of bricks, cylinders, and boards he would paint them with optical perspective and

conventional lighting.” Many cubist paintings are simply a product of this substitution.⁷⁶ Fernand Léger's *Nudes in the Forest* (Otterlo, Kröller-Müller Museum, 1909-1910) comes to mind. Gleize's aim, however, was to reduce painting to two-dimensional surfaces “To pretend to endow it with a third dimension is to wish to denaturalize it in its own essence. The results obtained will become only the trompe l'oeil of our three-dimensional material reality, through the deceptions of linear perspective and conventions of lighting.”⁷⁷

Mixing

Ultimately, Gleizes wanted to escape matching. The result was a new goal for painting. As he wrote in his manifesto: “Painting therefore is not an imitation of objects. The reality of the exterior world serves as its point of departure. But it strips away the world of this reality to touch upon the spirit.”⁷⁸

Hence the trend in matching, which focussed on the surface of painting, led to a new goal within cubism, which involved mixing the visual and mental world. While this re-opened the way for non-perspectival paintings, it also produced complex new combinations of perspective. Three examples must suffice here. In Juan Gris', *La Place Ravignan. Still Life in Front of an Open Window* (Philadelphia, Museum of Art, 1915), the still life in the foreground was composed of a series of intersecting planes, partly transparent, partly occluding. In the background, both wall and window were transparent. Hence the perspectival principles of transparency and occlusion became a matter of play, while its spatial effects continued to be important. Robert Delaunay, in his *St. Severin* (New York, Guggenheim Museum, 1909), went back to the Renaissance theme of Church interiors, introducing subjective curvatures into the straight lines of the architecture. By contrast, Jacques Villon, in *Abstraction* (Philadelphia, Museum of Art, 1932), used a room with very sharply defined perspectival lines as in a Renaissance interior, but then removed details and played with colour to create unexpected effects. Other movements in modern art, which shared this goal of mixing outer and inner worlds, led to further experiments with perspective: constructivism (Kasimir Malevich, El Lissitzky, Josef Alpers);⁷⁹ surrealism (Max Ernst, Yves Tanguy, Salvador Dali),⁸⁰ neo-romanticism (Eugene Berman) and magic-realism (Pierre Roy, Paul Delvaux).⁸¹

Implicit verbal sources remained important. It would, for example, be difficult to understand the symbolism of Salvador Dali or Paul Delvaux without some biographical context. But a new dilemma now loomed. For the more these paintings entered into the inner life of the individuals concerned and became personal expressions, the more they required autobiographical knowledge, which could not be expected of a general public. In the Renaissance, the emergence of universally known texts such as the *Bible* had led to visualizations of implicit verbal sources becoming more important than direct illustrations of texts. In the twentieth century, as the concept of such universally known texts receded, a reversion occurred: direct illustrations of verbal sources once again became more important than visualizations of implicit verbal sources, whence the extraordinary rise of a whole new genre of deluxe art books (*Les livres d'art, Malerbücher*) which involved most major artists of the twentieth century ranging from

Braque and Eluard to Hockney.⁸² Picasso alone produced over 150 of such books.⁸³ This renewed concern with a verbal filter detracted attention from perspectival visualization.

Exploring

Meanwhile, another new goal involved exploring three further horizons of arts: chance, the inner world and the perceptual world. The first of these, emphasizing intuition, and relying largely on accidental actions and chance patterns, involved abstract expressionism (Hans Hofmann, Sebastian Antonio Matta Echauren, Willem de Kooning, Jackson Pollack).⁸⁴ The second of these explored the inner world: phantasy and the irrational. In the nineteenth century, romanticism had led to the creation of dream worlds (Gustave Moreau, Rodolphe Bresden, Odilon Redon).⁸⁵ These continued into the twentieth century with the naive painters (Henri Rousseau),⁸⁶ and the metaphysical school (notably Giorgio di Chirico),⁸⁷ which led to further explorations into the irrational through dadaism,⁸⁸ surrealism⁸⁹ and conceptualism.⁹⁰ Striking is the extent to which these inner visions emphasize perspectival space. Even in the art of mentally disturbed persons, despite distortions, a basic spatial pattern is usually still recognizable and sometimes has a compelling coherence of its own (e.g. William Kurelek).⁹¹

A third area of exploring has involved the perceptual world. It could be argued that this was effectively an extension of the detailed attention to visual effects initiated by the impressionists. In Antonio Lopez Garcia's drawing of *Antonio Lopez Torres* (London, Marlborough Fine Arts Ltd., 1971-1973), for example, which Arnason⁹² cites simply as part of the revival of representational painting in the 1970's, we note curvilinear effects on the floor reminiscent of those found in Cezanne⁹³ and Van Gogh.⁹⁴ Inspired by nineteenth and twentieth century optical theorists (Helmholtz, Hillebrand, Ames, Luneburg),⁹⁵ a number of painters have claimed that spherical perspective more closely approximates the effects of vision than does linear perspective. In the nineteenth century, thinkers such as Hauck had considered spherical projections as subjective perspective.⁹⁶ Panofsky followed this approach.⁹⁷ However, recent thinkers such as Barre and Flocon or Hansen claim⁹⁸ that spherical projections exemplify objective perspective.

In terms of strictly scientific principles of vision, the most succinct challenge to these views remains Pirenne,⁹⁹ whose work also poses problems for Termes' experiments¹⁰⁰ with one, two, three, four, five, and six point perspective, or Blotti's explorations¹⁰¹ of alternative projection methods. To enter into great polemics as to who is right, would be to assume that both sides are concerned with the same thing, which they are not. Impressionists such as Pirenne's father, and Pirenne himself, were concerned with information available to one eye, from a given station point, at a given time and place. These contemporary artists, by contrast, would argue that no single viewpoint does justice to the complexities of visual experience and that the challenge lies, therefore, in incorporating, combining, integrating different viewpoints simultaneously in achieving panoramic effects, such as we experience when we walk around in every day life. Certainly no eye from a single viewpoint could see all the images on the 360 degree spherical surfaces of Albert Flocon's *Tableau spherique* (Paris, Grand Palais) or of Dick Termes' *Termespheres*. Yet a painting, which does not stop with the artificial boundaries

of a frame and which continues to unfold as we walk around it, comes closer, they would argue, to our experience of the visual environment of every day life.

This quest to incorporate various viewpoints simultaneously has led artists such as Lucien Day to renew interest in cylindrical projection planes, not as a rejection of linear perspective, but rather as an attempt to go beyond its limitations. In Day's own words:

My work is an attempt to incorporate more than one angle of vision in a picture plane. I want to expand the means of academic perspective to include more of what we see and how we see it.... Working with a camera, I am able to freeze these changed peripheral elements and use them as part of the picture. Instead of a fixed viewing eye, which is the basis of academic perspective, I make two angles of vision work together.¹⁰²

As Marcia Clark has recently demonstrated in an important exhibition, Day's concerns are part of a new trend which includes Susan Crile's multiple perspectives, and Clark's own combination paintings in which, as she explains: "Though the painting is seen in three parts these connect in the mind's eye. Both the shifting perspectives and the serial nature of the painting bring a dimension of time into the visual experience. Within this, a process of discovery can unfold, reflecting not only the view but also the experience of seeing."¹⁰³

In the context of our analysis three aspects of this trend are of particular interest. One is how artists such as Clark, Crile and Lima consciously speak of their work as metaphor.¹⁰⁴ Second, is the way in which artists such as David Hockney, David McGlynn and Richard McKown use photography, with its objective perspectival-images, as a starting point for their subjective explorations of perceptual spaces.¹⁰⁵ Whereas an earlier generation would have perceived oppositions between art and science, subjective and objective methods, this generation is exploring how they can be integrated in new ways. Related to this is a third phenomenon: for the quest to integrate different spaces has focussed attention on the challenge of relating different times. Clark referred to this in the passage cited above. Hockney has drawn attention to it: "It's a different time in each square and as I went I found, suddenly at times, incredible spatial effects happening, which made one realize that time was deeply related to space - maybe they were the same thing - and immediately I noticed its connection with cubism."¹⁰⁶ McKown has been even more conscious of this process:

...each image in my work starts out as a separate exposure in the camera. I want the viewer to experience the time element by looking at the individual images before looking out at the illusion of the whole composition.... I'm working with the aspects of cubism. However, by my use of photography, there is a reference to reality that pulls the image into a whole instead of fragments, so that the concept of time is slowed down and expanded.¹⁰⁷

In emphasizing such temporal-spatial problems, these painters were, in a sense, pursuing themes which Carpaccio had explored nearly five centuries earlier and demonstrating in a

1400-1499	1
1500-1599	456
1600-1699	732
1700-1799	849
1800-1899	2714
1900-1989	2801

Figure 5. Books on perspective published since 1400.

new way the limitations of Lessing's aesthetics, which opposed painting and poetry in terms of space and time. Indeed, it could be argued that the full implications of perspective for temporal-spatial dimensions of painting are only now coming into focus.

In moving from pre-literate to literate society, imitating replaced connecting as a goal. What is striking about these recent developments, however, is that they have not replaced existing goals such that ordering, matching, mixing and exploring, with their various subcategories: all exist together. At a certain level, evolution is embracing, not replacing. The full significance of this phenomenon has yet to be assessed. It is instructive to recall, for instance, that just over a half century ago Novotny wrote an influential work entitled, *Cezanne and the End of Scientific Perspective* (1938).¹⁰⁸ He was by no means alone. Many of his contemporaries were fully convinced that exploring chance and abstraction had become the only goal of modern art, and even today, some scholars still assume artistic progress occurred in terms of one goal at a time.¹⁰⁹ In these minds, art history since 1500 could be reduced to a simple story of how artists gradually rejected perspectival principles, and the twentieth century became a final chapter in a move from perceptual to conceptual art.¹¹⁰

Our all two brief outline has shown a rather different story. For if perspective was rejected by those exploring chance and abstraction, it has proved essential in exploring both the perceptual world and the inner world (naive and metaphysical art), in new goals of mixing outer and inner world (cubism, constructivism, surrealism, neo-romanticism and magic realism) and new branches of matching (precisionism, pop art, new realism, photo realism, hyper realism). All of which helps to explain the pattern of publication revealed in figure 5.

Perspective did not die: it did not even experience a serious decline. Since 1500 its story has been one of continuous development. What began as a mechanical means of recording the outer world objectively in quantitative terms has become a fundamental method for exploring the inner world with its subjective dimensions. Perspective has led the west to create more images than any other culture. In the process it has given us a concept of visual metaphor, leading to ever subtler plays on is-is not, teaching us that seeing is also seeing through, revealing positive dimensions of illusion, opening our image-ination, asserting in unexpected ways our freedom as individuals.

Two generations ago, the greatest scholar in the field, Erwin Panofsky, could plausibly claim that perspective was a symbolic form,¹¹¹ that a given culture was bound to a

particular method of spatial representation: that spherical perspective belonged to antiquity and linear perspective specifically to the Renaissance. This tantalizing hypothesis unfortunately raised more problems than it answered: what evidence was there that the Greeks had developed a coherent method of spherical perspective? Why did some scholars insist that the Greeks had linear perspective? If linear perspective truly belonged to the Renaissance, why was it that this period also offered the first serious evidence of spherical (Fouquet), cylindrical (Marolois) and conical (Vaulezard, Nicéron, Dubreuil) perspective? Why should spherical perspective have found new exponents in the nineteenth century (Hauck, Ware)? Indeed what happened to culture after the Renaissance?

Panofsky,¹¹² his colleague Cassirer, and Aby Warburg, at whose institute they both worked, had been inspired by neo-Kantian theories of culture (e.g. Cohen),¹¹³ which began with a premise that there was progress, that each stage in cultural evolution brought a new world view, and that each world view determined perception and representation, in both theory and practice. This implied that any given culture was limited to a single method of representation, and progress would, therefore, be a simple linear development. Ironically Panofsky's own studies suggested, and Warburg's meticulous research showed conclusively, that the details of Renaissance art involved so many particulars and contradictions, that they could not be reduced to one goal of representation determined by a single, universal world view.

Warburg's biographer,¹¹⁴ who later became director of his institute, pursued these problems in three studies in the art of the Renaissance (*Norm and Form, Symbolic Images, The Heritage of Apelles*),¹¹⁵ in which he examined the environment that made different artistic expressions possible, as a direct challenge to deterministic claims. But he devoted his main energies "to study some of the fundamental functions of the visual arts in their psychological implications."¹¹⁶ While insisting that art has a number of different goals or functions including narrative, caricature and symbolism, Sir Ernst Gombrich focussed attention on two major functions: ornament (*A Sense of Order*)¹¹⁷ and illusion (*Art and Illusion, Illusion in Nature and Art, Image and the Eye*).¹¹⁸ He saw the problem of illusion as relatively well defined: "It basically concerns the process by which the rendering of the visible world was seen to change from schematic to naturalistic styles - a process which can be observed twice in the history of art - in classical antiquity and again in the Renaissance."¹¹⁹

This suggested, however, that the Renaissance brought nothing new, that it was literally a rebirth,¹²⁰ and simply involved a repetition of ancient illusionistic tricks. Underlying this approach was an important assumption: that concepts of progress and determinism were necessarily linked, and that in order to escape the totalitarian perils of the latter, it was wiser to forego entirely the very idea of the former.¹²¹

This essay points beyond these problems of either-or. The six goals of art outlined above are not deterministic in a narrow sense. We have shown that Antiquity tried at least five different versions of imitation; that the Renaissance practiced linear, conic, cylindrical, spherical and parallel perspective, and that there has been an even greater diversity in the

modern period as a simple glance at Blotti's alternatives reveals. Therefore, simplistic equations between one world-view, one theory of vision and one practice of representation can be rejected outright. Nonetheless, certain goals favoured some methods, and actually precluded others. We have shown, for instance, that connecting, ordering and even imitating precluded perspective, whereas matching, mixing, and most branches of exploring required perspective.

The climates which precluded or favoured perspectival representation were more than a question of theory. They involved architectural construction, such that building spaces with perspectival effects was an important prerequisite for perspectival representation. They were also bound up with levels of literacy: connecting and ordering requiring none, imitating needing some, matching requiring a textual community, mixing and exploring requiring complex textual communities with a heritage of both visual and verbal images.

Seen in this way both Antiquity and the Renaissance emerge as distinct phases, and a cumulative dimension of culture comes into focus. The Renaissance could never have attempted its synthesis of Christian and pagan images had there not been these two traditions, had these not been a well-established culture, which made this heritage accessible. Whereas Ancient imitation limited itself to representation of universals, Renaissance matching opened art to representation of individuals and took art in at least ten new directions (figure 6). Some of these evolved simultaneously: e.g. the visual world, illustrating verbal sources directly, implicitly, recurring events and topoi. Others, such as illustrating verbal sources as every day life, with play, irony or distortion were only possible when new levels of distance had been reached, and these levels, once attained, rendered difficult return to a more naive level. Hence the process was not only cumulative: it tended at a certain point to become irreversible.

Earlier goals of art linked visible and invisible worlds: connecting, for example, linked a visible statue with an invisible god; imitating linked visible statues with invisible gods and concepts, thus leaving only one side of the equation testable, and keeping object and subject conflated. By contrast, in the Renaissance, perspectival matching established links between visible objects and visible representations, thus making both sides of the equation testable and, at least a theory, separating subject from object. Cassirer, in his *Individual and the Cosmos in Renaissance Philosophy* (1928) described the subject-object distinction as a static event, brought about by a shift from a finite to infinite world view.¹²²

1	Connecting		
2	Ordering		
3	Imitating	1	Narrative
		2	Ideal world
		3	Isolated objects
		4	Isolated objects-using optical adjustments
		5	Imaginary scenes-using optical adjustments
4	Matching	1	Directly
		2	Verbal sources
		3	Implicit common verbal sources
		4	Implicit common verbal sources as everyday life, landscape
		5	Implicit common verbal sources as play, irony
		6	Implicit uncommon verbal sources
		7	Recurring events, topoi
		8	Distortion (anamorphosis)
		9	Distortion through simplification
		10	Surface
5	Mixing	1	Directly
		2	Verbal Sources
		3	Implicit verbal sources
6	Exploring	1	Mental world
		2	Perceptual world
		3	Algorithmic world
		4	Chance

Figure 6. Six basic goals of cultural and artistic and expression.

In our analysis, the subject-object distinction grew out of an interplay of perspective, new levels of literacy, and interpretation, was dynamic, and should be seen as part of a larger process involving increasing levels of distance.

Perspective thus emerges as something much more profound than an early copying tool. It led to a systematic exploration of interiors and exteriors, of inside and outside space in the natural world, and pointed to new distinctions between inner and outer at a psychological level. If its matching function brought the natural world into closer focus for study, it was simultaneously a distancer. Hence, there was a two-fold way in which perspective brought a new power over images: first, it introduced systematic combination and play in the representation of basic spatial forms. Second, it led to representation being recognized as something separate from the observer, at levels of greater aesthetic distance, such that playful treatment of images in another sense became possible also.

There remained a serious side to this playfulness, however. For the method which rendered nature visible for man, and liberated man from nature, also threatened to separate him in the negative sense, to alienate him. Connecting had assured a feeling of being at one with nature through communal rituals involving a totem.¹²³ With matching this communal assurance was gone, and reassurance was at an individual level, using representations in galleries to reestablish relationships with nature. Seen in this way the art galleries of our cities are by no means luxuries. Even the visual metaphors and puns on billboards in major cities are more than advertising gimmicks: they are a part of a process helping us to see through illusion and gain more distance from nature and ourselves without becoming alienated: teaching us to see our relationships.

Perspective is therefore much more than an instrument of art. It is an instrument of civilization, creating representations convincing enough that we can accept them as substitutes for the most threatening dimensions of reality: such that pictures, movies and videos, become substitutes for war, violence, rape and other forces of destruction, while at the same time threatening to stimulate the very things they were aimed to prevent. At the limit, a life of action in the field risks becoming a life of reaction to a camera or a screen. But this may be the price for a method, which transformed the closed, prescriptive rules of representation to an open, descriptive approach, which encourages new images, challenges creativity and imagination, and asserts our fundamental freedom.

4. Threats to Culture

An extensive study of the threats to culture would lead to an independent monograph. Here our purpose is merely to signal a few pressing issues, namely, unstable politics, some recent trends in global business, notions of evolution involving memes and simplistic trends on the Internet.

Unstable Politics

Traditionally there has been an understanding that even in war, there should be a common respect for individual civilian lives and for cultural treasures. Hence, even the Germans in the Second World War, notwithstanding that they "stole" a number of treasures were very careful to protect art and cultural treasures, including Jewish items in Berlin. In the case of Montecassino their care saved the Mediaeval riches from destruction by the Allies.

More recently there has been a profoundly disturbing trend whereby one of the chief acts of conquest lies in trying to destroy the cultural history and memory of the vanquished. Hence, the turmoils in the former Yugoslavia have seen the destruction not only of individual houses and buildings, but also a great number of libraries and archives, whereby the collective memory of regions has been annihilated. Similar patterns are evident in various revolutionary governments of Africa. Control means control of the mass media and destruction of the "enemy's" memory.

In some countries this process is more subtle. In Russia, for example, there is officially a strong tradition of research in archaeology and ethnology. On more careful inspection one discovers that these traditions bring to light patterns of movements of people's quite different than those of the present national boundaries and thus undermine them. It is instructive that these same scholars will insist that Russian national identity is not cultural identity. Hence Russia has founded a National Identity Network,¹²⁴ which is in great contrast to Poland where culture is equal to the national identity. Culture is cumulative. Hence memory is one of its central dimensions and needs special protection. Any threat to memory is a threat to culture.

Global Business

There is a long-standing, fruitful tradition linking business and culture. During the Renaissance banking families such as the Medici accumulated great wealth, which they invested through sponsorship of artists, poets and philosophers. In the early twentieth century, Aby Warburg, the son of one of the great modern banking families, founded the Warburg Institute, which became one of the most important institutes for the study of culture in our times. Already in the nineteenth century there was a tradition whereby the "Robber Barons" went to great lengths to earn everything they could and then proceeded to make enormous endowments for the arts and culture: e.g. Rockefeller, Frick, Huntington. This continued in the twentieth century with Ford, Hearst and more recently Getty. In a sense this tradition also set the stage for corporate sponsorship of the arts and culture which has played an important role until very recently.

All this was built on a simple model. One gathered money and then used it to collect things of lasting value. To some extent this too was seen as an investment, but at its heart lay a notion that one acquired money to acquire in turn things of more lasting value, to create collections which represented an accumulation of memory and value. Such patronage of the arts and culture also played an important part in international corporations. To cite only one obvious example: IBM, in addition to its moneymaking ventures, had a strong programme to support cultural dimensions, which included exhibitions on Leonardo da Vinci and special exhibitions on art around the world.

When sending their employees to work in a very different culture such as Japan, major corporations such as Bosch also introduced serious training programmes to help their employees understand different customs and different ways of doing things. All this is laudable.¹²⁵ One of the most impressive developments in this context has been a trend towards a systemic family of Quality Management Systems on behalf of the International Standards Organisation (ISO). This entails four basic elements: 1) fundamentals and vocabulary to ensure the communication of content management for critical communication (ISO 9000:2000); 2) interested party confidence of product customer satisfaction (ISO 9001); 3) organisational efficiency and effectiveness in overall performance (ISO 9004:2000); 4) quality and environmental management systems auditory (ISO 19011:2001). This family of standards, which builds on the work of ISO Technical Committee 37, will thus ensure international standards for quality re: management, performance, health, safety, environment and human diversity. The vision

is to create an ethic-economical framework, which produces long-term gain through short-term activity. Closely connected with this vision is an approach which respects human diversity.¹²⁶

At the same time, the past decade has seen the rise of a very different trend within the business world, namely, through new management strategies.¹²⁷ Under the rhetoric of creating a culture of change,¹²⁸ a rhetoric which also imbues the world of education,¹²⁹ there are attempts to identify creative content without history, memory, religion, or belief. From this has grown the notion of corporate culture.¹³⁰ This has the enormous advantage that change can be instigated without recourse to precedent, rights or anything. It has the disadvantage because it means that the connection between culture and cult is removed. There is no real memory, no collecting, no accumulation, no increasing value, indeed there is nothing linked with the traditional aspects of culture.¹³¹

Traditional culture as we have noted is about sharing experiences and is cumulative. It brings identity, without diminishing respect for other cultures. It becomes more valuable with time not only because there is more of it, but because the sources to which it can allude, the references, inferences and implications it can connote and denote are much richer. The new corporate "culture" is the antithesis of this approach.¹³² The new corporate culture is merely about finding logos and slogans which set one group out from another. As such it does nothing to deepen one's long term identity, or to help increase respect for others. It is not cumulative *qua* values: it is only concerned with accumulating more monetary wealth for the corporation. Wealth has of course always been a concern of business. But when it is the only concern to the extent of ignoring personal, regional, and national values, it becomes a serious threat to culture.

Some would link this new trend in management with recent developments within the World Trade Organisation (WTO),¹³³ as a result of which decisions by WTO can theoretically override the decisions of individual countries.¹³⁴ Extreme interpretations of this trend claim that the sovereignty of the nation state is thereby rendered obsolete. In our view there is a deeper reason for concern. As noted below (cf. figure 12), culture exists and needs political attention at seven levels ranging from local urban settings to the international sphere. Very much needed are political structures, which create greater co-ordination between those levels. If international power and wealth shifts to global corporations with no commitment to culture at any of these levels, then culture will be endangered in new ways.¹³⁵

Evolution

In the nineteenth century the ideas of Darwin in the life sciences were soon applied to the social sciences (and the humanities) in the form of what came to be known as social Darwinism. Archaeologists such as General Sir Pitt Rivers attempted to apply this approach to culture also. There are fundamental problems with an evolutionary approach to culture. First, major cultural artifacts such as the Venus de Milo are unique expressions and cannot be "better" simply by adding limbs, making them larger or other "improvements." As Croce put it: "Art is intuition and intuition is individuality and

individuality does not repeat itself. To conceive of the history of the artistic production of the human race as developed along a single line of progress and regress would therefore be altogether erroneous."¹³⁶

Second, an evolutionary approach can readily lead to a one-tracked teleological vision, which assumes that art has but one goal. As we have shown in the previous section art and culture have a number of goals. Thirdly, if there were cultural evolution in a simple sense, then earlier works would necessarily be outmoded and less valuable now than they were at the time of their creation. The *Mona Lisa* is not less valuable than a painting by Jackson Pollock because it is older. On the contrary, older cultural objects are typically much more valuable than new ones.

In the past decades, such basic truths have frequently been forgotten by those wishing to re-ignite notions of progress in art. This is also true of the latest attempt by Daniel C. Dennett, a leading proponent of the computational theory of the mind, who is seen by some as "reforming the role of the philosopher," and is particularly supported by thinkers such as Marvin Minsky in the field of artificial intelligence.¹³⁷

Dennett sets out to explain the evolution of culture from the premise that "the humanistic comprehension of narratives and the scientific explanation of life processes, for all their differences of style and emphasis, have the same logical backbone."¹³⁸ He would have us approach the question of the why of culture (*cui bono*) partly in terms of cost benefit analysis, adding: "The perspective I am talking about is Richard Dawkins' *meme's-eye point of view*, which recognizes--and takes seriously--the possibility that cultural entities may evolve according to selectional regimes that make sense only when the answer to the *Cui bono* question is that it is the cultural items themselves that benefit from the adaptations they exhibit."¹³⁹

Dennett cites Dawkins to note that we can think of cultural memes as parasites, that "they are like viruses." "And in the domain of memes, the ultimate beneficiary, the beneficiary in terms of which the final cost-benefit calculations must apply is: the meme itself, not its carriers." He goes on to classify three kinds of hitchhikers: parasites (whose presence lowers the fitness of the host; commensals (whose presence is neutral) and mutualists (whose presence enhances the fitness of both host and guide). He goes on to take exception to Wilson¹⁴⁰ to suggest that "cultural possibility is less constrained than genetic possibility." By way of illustration he cites examples of drumming, humming and Bach in music.

While Dennett is at pains to insist that his explanation is complementary with traditional explanations of culture in terms of "wilful creativity," as with other proponents of memes such as Susan Blackmore,¹⁴¹ there is a curious way in which this approach undermines the role of individual expression which Croce, cited earlier, saw as paramount. While it is true that Dennett's approach gives an unexpectedly new meaning to the phrase "art for art's sake," it is difficult to see what is to be gained by these so-called viral insights. What do we gain (*cui bono*) by abandoning the role of the artist's intent, or notions of culture as the invisible bonds of society through shared experiences?

Also lacking in the meme approach is any notion of multiple goals of culture and hence any framework which allows us to understand the complexities of both local and national differences, why the characteristics for excellence in China or India are quite different from those in Europe. It offers us a one-dimensional answer to a multi-dimensional and multi-cultural tradition. It is a dangerous simplification.

Dennett's approach is linked with another trend in American thought towards a so-called third culture. In 1959, the late Lord C.P. Snow published his book *The Two Cultures* in which he lamented a growing tendency whereby humanists and scientists no longer shared the same universe of discourse. Recently American thinkers such as John Brockman, claim that they are heading a third-culture, by which they mean scientists with a commitment to public communication:

The third culture consists of those scientists and other thinkers in the empirical world who, through their work and expository writing, are taking the place of the traditional intellectual in rendering visible the deeper meanings of our lives, redefining who and what we are.

....what traditionally has been called "science" has today become "public culture." Stewart Brand writes that "Science is the only news. When you scan through a newspaper or magazine, all the human interest stuff is the same old he-said-she-said, the politics and economics the same sorry cyclic dramas, the fashions a pathetic illusion of newness, and even the technology is predictable if you know the science. Human nature doesn't change much; science does, and the change accrues, altering the world irreversibly." We now live in a world in which the rate of change is the biggest change. Science has thus become a big story.¹⁴²

Striking in the above passage is the same emphasis on change and on the the new as is so evident in business, education and other fields. It may well be true that these are becoming the leitmotifs of public culture. It is very important to recognize, however, that the values of shared experience, shared memory, continuity and accumulative worth reflected by the larger view of culture espoused in this essay lead us to very different insights. Science is clearly important.¹⁴³ The use of science in understanding cultural heritage is obviously valuable. But when persons in the name of science, which is concerned with general, immutable laws, pretend to have the answer to all our individual expressions, then we must be very wary. Such a rhetoric concerning science can readily pose serious threats to culture.¹⁴⁴

Historians will be aware that these dangers are not new. In 1874, the Russian philosopher, Vladimir Solovjev, a friend of Dostoyevsky, published his *Crisis of Western Philosophie against the Positivists*. As Noemi Smolik has recently noted in an illuminating article,¹⁴⁵ this work inspired several generations of commentary within Russia which led via Andrej Beljj, Velimir Chlebnikov, Roman Jacobson, Vassily Kandinsky and Kazimirs Malevich. These thinkers focussed on the Russian word, *stroenie/postroenie*, which as Smolik notes can be translated both by the word *construction* and the word *structure*. As she points, out this group led to both the constructivist and the structuralist¹⁴⁶ movements

as well as to postmodernism.¹⁴⁷ Hence what began as an attempt to remedy tensions between the aims of art (creativity) versus those of science and technology (control and production in addition to the age old quest for understanding), inspired precisely those movements which would have us believe that there is nothing to be learned from the cumulative experience of historical knowledge. Without knowing it the proponents of the third culture would appear to be headed in a parallel if not identical direction.

Internet in Simplistic Versions

The Internet is a magnificent resource for culture at many different levels.¹⁴⁸ For instance, the WWW Virtual Library with respect to Museums compiled by Jonathan Bowen offers a wonderful overview of the rich resources which are becoming available.¹⁴⁹ By contrast there are some sites which appear authoritative and yet are extremely reductive in their treatment of cultural complexity. For instance, a site called about.com,¹⁵⁰ divides the world's cultures into four areas: 1) Africa/Mideast; 2) Americas; 3) Asia/Pacific; 4) Europe.

The Americas¹⁵¹ are reduced to African-American Culture, Arctic/Northern Culture, Asian-American, Caribbean, French-Canadian, (but not Canadian) Culture, Latino, Mexican and South American. Europe¹⁵² is reduced to Eastern Europe, and the cultures of England, France, Germany, Greece, Ireland, Italy, Russia, Scotland, Spain, Switzerland and the United Kingdom (typically under the headings of language, culture and visitors). Asia/Pacific¹⁵³ is reduced to Australia, China, India, Japan and South Asia.

Africa is divided into five regions (central, eastern, northern, southern, western) and 9 museums and galleries are listed.¹⁵⁴ By contrast, Jonathan Bowen's¹⁵⁵ excellent site lists 22 museums for Africa and a further 19 for the Middle East. (i.e. Lebanon 4, Israel 8, Kuwait 1, Turkey 4, UAE 2). The about.com also limits the themes of beliefs and folklore to contemporary topics¹⁵⁶ and has equally trendy categories for groups/subcultures,¹⁵⁷ senior living, religion/spirituality and sexuality.

Such simplistic interpretations of reality are nothing new. In the past, however, they were frequently not accepted by serious publishers and thus tended to remain as single manuscripts or in small quantities produced by a private publication. The Internet now allows individuals to publish their views internationally. Censorship is ultimately not a very interesting solution for this problem. Methods such as the Resource Description Format (RDF) being developed by W3 Consortium, offer a way to rate the relative value and the veracity of such sites. At the level of governments and public bodies there is also a new challenge. They must ensure that they convey a sufficiently rich picture of their own cultures. Else others who are less qualified may well (mis-) represent in ways that undermine the universality that potentially underlies the vision of the Internet.

On this front, the good news is that countries all over the world are beginning to make available cultural and other materials. Canada has had a Canadian Heritage Information Network (CHIN) for 27 years. Germany created the second such network through the Marburg Archive. Australia has an excellent network. The United States has recently

established a National Initiative for Networked Cultural Heritage (NINCH). The efforts of the MEDICI Framework in Europe have been mentioned earlier.

The bad news is that most persons are still unaware of the magnitude of the phenomenon of the Internet. Even awareness of basic statistics is frequently lacking. There is a mistaken impression that the Internet is mainly an American phenomenon and almost exclusively in the English language. A survey at Georgia Tech¹⁵⁸, for instance, claims that 92.2 % of sites worldwide are in English and that 98.3 % of sites in the U.S. are in English. Even the august Club of Rome, in a recent report, cited the Internet Society to claim that English accounted for 82 % of all web sites.¹⁵⁹ One serious source notes a quite different range: English, 59.3%; Non-English 40.7%; European Languages (non-English), 26.2%.¹⁶⁰ Meanwhile, the latest news on this front by Jeffrey Harrow paints a rather different picture again:

The World Map Of The Web Is Changing -- If you recently drew a map of cyberspace it would seem to be North American-centric. But if that's the type of map you want, it may already be too late to get one. Because according to the July 12 *eMarketer*,¹⁶¹ while 56% of Internet users were in North America at the end of 1998, they expect that by the end of this year the scales will tip in favor of the rest of the world. More than 50% of Internet citizens will reside elsewhere.

By 2002, North American Internet users, while continuing to grow, will have shrunk to one-third of the world's Internet population due to increases in places such as in Europe! Europe will have 84 million Internet users, or 30% of Internet users worldwide.¹⁶² Asia will have 60 million users, or 22%, and Latin America will have 27 million users, or 9% of worldwide Internet users.¹⁶³

We all need to become more aware of the magnitude and diversity of the Internet phenomenon, and to ensure that information concerning our cultures adequately reflects the complexities thereof.

5. World Map of Culture

Needed is a new kind of world chart of cultural values and expressions which is not limited to the taste of an isolated scholar, the fashion of a particular school, of some nation or even to a single continent such as Europe, North America, or Asia. In a world where multi-national corporations have made a global economy part of everyday life, where Internet is linking hundreds of millions of persons daily, we need a more comprehensive vision of world culture whereby we can understand the richness and complexity of culture around the world. Such a world map of culture will entail both the material history and a history of meaning of objects and thus require a far greater degree of contextualisation than has hitherto been considered necessary or even possible.

Pointers	1	Terms	Classification Systems
	2	Definitions	Dictionaries
	3	Explanations	Encyclopaedias
	4	Titles	Bibliographies
	5	Partial Contents	Abstracts, Indexes
Objects	6	Full Contents	Paintings, Instruments, Books etc.
Interpretations	7	Internal Analyses	
	8	External Analyses	
	9	Restorations	
	10	Reconstructions	

Figure 7. Basic domains and levels of knowledge.

Material History¹⁶⁴

At present, leading institutions such as the National Gallery of England are developing an integrated system whereby information concerning accession of individual paintings is linked with materials in the main catalogue, exhibition catalogues and research which typically appears in the gallery's technical bulletins, and specialized publications. This approach should be used in all museums and galleries and also extended into a new concept of collections management. We need a systematic approach to the pointers to knowledge concerning objects as in reference rooms,¹⁶⁵ the objects themselves, and the interpretations thereof. We need access not only to the images of a painting or object, but also all restorations thereof: i.e. a history of all the interventions that have been made over the centuries (figure 7).¹⁶⁶

To see a painting in a gallery or an object in a museum is to see it out of context. Ideally we should know about the original environment for which the painting or object was made. Since this original environment has almost invariably been altered, (else the painting would still be in its original location), we need reconstructions¹⁶⁷ of that original environment. Ideally we should also have information about the interim institutions where the painting resided, including the various places where it has hung within the present institution. This amounts to an extension of the excellent approach introduced in the Getty Trust's Provenance Index, with the major difference that this new collections management will allow potential tourists, visitors and researchers to see images of the environments as well as verbal descriptions. Finally the system will provide access not only to the museum's internal publications concerning the painting but also to all the literature available in libraries and archives (figure 8).

1	Object	
2	Original Environment	Church, Palace, Archaeological Site
3	Reconstruction of Original Environment	Ruined Temple, Church
4	Interim Institutions	Earlier Collections
5	Present Institution	Museum, Gallery
6	Information Concerning	Library, Archive

Figure 8. Six elements *qua* reconstruction in the contextualisation of a cultural object.

Concrete examples in the direction of such an integrated approach to contextualisation already exist. For instance, the Nu.M.E. (*Nuovo Museo Elettronico della città di Bologna*) project at the University of Bologna¹⁶⁸ is reconstructing not only individual buildings but the entire mediaeval city of Bologna with a temporal dimension such that one can witness the city's history as if one were in a time machine. One can see how the thirteenth century version changes during the Renaissance, and through the centuries until one arrives at the modern city. One can go from a painting or illuminated manuscript image of what the town looked like at a particular time. These show that there once existed a monument, which was later removed because it blocked traffic. One can go to a reconstruction of this monument and then trace how individual pieces of thereof are now scattered in the Cathedral of San Petronio, and the Cleveland Museum of Art.

The amount of information available concerning an environment varies enormously. The city of Bologna is extremely fortunate to have wonderful archives which document the last eight hundred years in enormous detail. Other cities have been ravaged by great fires, war, revolution and the like. Similarly the amount of information available about a given painting or museum object varies enormously. Leonardo's *Mona Lisa* and Van Eyck's *Ghent Altarpiece* have hundreds of publications. Other paintings have never been seriously studied.

Ultimately this new approach will lead to much more than a tourist guide par excellence: a Baedeker or Michelin of the twenty-first century. This contextualisation will allow us to study the image histories of a given painting or object, all the copies, versions, variants, by the painter, by their students, in their workshop, in the school of etc. Ideally it will allow us to trace other locations of paintings by a given artist, to trace paintings by theme or subject and even to trace these across the whole spectrum of different media (cf. figure 10). As such the traditional printed *catalogue raisonnée* will be replaced by an online version accessible through wireless connections accessible not only in museums but at any place and anytime.¹⁶⁹ To achieve this will require the development of new meta-data.¹⁷⁰

These new methods will not replace the experience of the real thing, except in the case of special sites such as the Caves at Lascaux or the Tomb of Nefertari which are closed to the public anyway for conservation reasons. Rather, the new approach will offer complementary experiences to those of the past. Standing on the hill at Pergamon one will be able to see the Pergamon Altar in the Bode Museum in Berlin. Conversely, standing in front of the altar in Berlin one will be able to see the archaeological site from which it was taken.

In addition, this systematic approach will offer us insights into the history of taste and study. We shall have art historical equivalents of reception theory in literature. We shall be able to trace what major themes preoccupied a given period, a country, a region or more specifically a specific group. We shall have virtual museums, which show us the different spaces and contexts in which a famous work of art was placed in the course of the centuries. Such patterns will also take us into the history of meaning concerning the works of art in question (i.e. items 7-10 in figure 4) and as such provide new ways of

understanding the history of taste. If, for instance, I accept the criteria for art from Paris in the 1770s, which paintings in my repertoire would come to the fore?

Meaning History¹⁷¹

While the material history of objects will provide all records concerning physical aspects of objects, the history of an object's meaning will trace what it has signified over the ages. This requires an understanding of the goals, purposes and intentions, which led to a given cultural object. Two such goals with their origins in pre-literate societies have already been mentioned, namely, connecting and ordering. With respect to literate societies in Europe we have discussed four further goals: imitating, matching, mixing and exploring.

Here we have built on the enduring contributions of Sir Ernst Gombrich, who has demonstrated that the history of art (which for him includes painting, drawing, sculpture etc) cannot be seen as a single, simple line of development and must be studied as a series of parallel and even conflicting goals. He has shown, for instance that the magical function of so called primitive art (which we term connecting), must be separated from that of ornament (which we term ordering), and mimesis.

We have combined this approach of different goals of art with different levels of literacy, suggesting that these introduce different levels of abstraction through aesthetic distance (figure 4), allowing us to make further distinctions between these goals of representation, which are also useful in understanding why perspective occurred when and where it did. Indeed of the six basic functions which were considered (connecting, ordering, imitating, matching, mixing, exploring) we have shown how three precluded, one discouraged and two functions encouraged the use of perspective, and then only under special circumstances.

While this paper has focussed on examples from the European tradition, the attentive reader will note that the goals and categories of the approach lend themselves to a treatment of world culture. In all this our aim has been to avoid the dangers of simplistic cultural imperialism, offering an approach that opens new ways for comparative cultural studies.¹⁷²

Connecting and Imitating

The relative importance of these different goals will vary in accordance with the cultures involved. In contemporary society, for instance, connecting applies particularly to some South American countries, some African countries and aboriginals in Australia. Ordering applies more to Islamic countries. Certain kinds of imitating apply more to China and so on.

The forms of expression these goals acquire also varies. Hence in some cultures the totems are mainly statues, which we would associate with sculpture. In Ladakh, by contrast, the images of the deities take the form of elaborate masks and costumes which

are born by live "actors" in the course of religious festivals.¹⁷³ In Ladakh, one also finds very remarkable interplays between what Frazer would have characterized as the magical phase (of totemism and animism) and a religious phase (with a complex pantheon of gods). Their particular strand of the Buddhist tradition involves a long literary tradition with very complex religious symbolism whereby different elements, physical states, symbols, and colours are correlated with different emanations of the Buddha.¹⁷⁴ Such examples remind us that the "evolution" from a naïve or primitive connecting wherein the participants assume that the totem is the god, to more subtle distinctions, whereby the participants make connections between the concrete figures they see and the abstract powers in which they believe vary from one culture to another. One of the major challenges of a world map of culture(s) will be to determine how the different stages of abstraction and aesthetic distance outlined in figure 4 with respect to Europe obtain elsewhere in the world.

With respect to pre-literate societies, we need to trace the history, interpretations and associations of objects relating to basic needs as well as rituals and expressions as they relate to magic, myth, cult, and religion (connecting as in figure 2). For instance in the case of a basic need such as drink(ing), one would begin with a list of drinks such as tea, which would lead to varieties of tea (Ceylonese, Indian, Chinese, etc.) and lead to cultural expressions such as the Japanese tea ceremony or the English high tea.

In the case of mythology and primitive religions, one would begin with an object or force in nature such as the sun or thunder and then trace its different cultural expressions: how, for instance, the sun is Amon Ra in Egypt, Apollo in Greece, etc. how these fit into their respective pantheons and how their symbolism is expressed both in custom (in the tradition of Sir James George Frazer), performance (music, dance, song, theatre) and the fine arts (fresco, sculpture, etc.). Here one would wish to trace how one reported or recorded source served as a recipe for multiple versions¹⁷⁵, forms, and expressions. Where possible one would trace how some basic myths of local cults subsequently evolve into (major)¹⁷⁶ religions. Here the methods of art history will become closely intertwined with those of ethnology, anthropology and sociology. To be studied is whether our suggestion about the role of art in creating aesthetic distance is confirmed by the sources.

With respect to the major religions such as Christianity one would begin with lists of the individuals therein, namely, Christ, the Virgin Mary, the Apostles and the saints. In the case of Christ one would have access to the major texts (notably the *New Testament*) plus a list of key episodes in his life, including: *Birth, Flight into Egypt, Circumcision, Preaching in Temple, Baptism, Walking on Water, Miracle of the Fishes, Marriage of Cana, Raising of Lazarus, Last Supper, Flagellation, Crucifixion, Deposition, Resurrection, (Dinner at) Emmaus, Ascension, and Last Judgement.*

1	Texts
2	Texts, Commentaries
3	Texts, Commentaries, Cultural Objects
4	Texts, Commentaries, Cultural Objects, Performances
5	Texts, Commentaries, Cultural Objects, Performances, New Media

Figure 9. Five combinations of cultural products resulting from shared experiences.

In the past the history of art and cultural history often focussed on cultural objects as isolated phenomena. Using the approach to culture as shared experience, a new history needs to be written which begins with a given verbal expression (text) and then traces both its verbal and its various visual expressions.¹⁷⁷ With respect to verbal expressions this will include texts and commentaries. With respect to visual expressions this will include cultural objects (paintings, drawings, engravings, sculpture etc.), as well as performances (opera, ballet, music, theatre) and new media (interactive television, electronic art, etc.) (figure 6).

A systematic treatment of these sources will allow us to correlate the numbers of episodes in the life of Christ with various media (mosaic, fresco, inlaid wood) and trace how these vary in number and significance in different places and in the course of different periods (figure 10). From this it would become evident that even in the case of countries with the same Christian heritage, their treatment of a theme such as the life of Christ varies considerably. Switzerland, for instance, has a surprising number of detailed cycles of the life of Christ in mediaeval churches, which have been largely forgotten in standard histories of art.¹⁷⁸

Place	Medium	Italy	Burgundy	France	Netherlands	Germany
Walls	Mosaic, Fresco	*				
Chapels	Fresco	*				
Ceilings	Fresco	*				
Choirs	Inlaid Wood	*				
Altars	Oil On canvas	*			*	*
Predellas	Fresco, Tempura	*				
Paintings	Oil on Canvas	*				
Reliefs	Sculpture	*				
Manuscripts	Painting	*	*	*	*	*
Books	Woodcut	*	*	*	*	*
Engravings	Ink on Paper	*		*	*	*
Gardens	Earth, Plants	*		*	*	*

Figure 10. Some of the different media in pictorial narrative cycles (in perspective) favoured in Italy, Burgundy, France, Netherlands, and Germany.

Country	Text	FineArts	Static			Performance	Dynamic	
		Mosaics	Illustrations	Painting	Sculpture	Theatre	Puppets	Music
India	<i>Mahabharata</i> ¹⁷⁹		*	*	*	*	*	*
	<i>Ramayana</i>		*	*	*	*	*	*
	<i>Buddhist Texts</i>		*	*	*	*	*	*
Israel	<i>Bible</i>	*	*	*	*	*	*	*
Greece	<i>Iliad</i> ¹⁸⁰	*	*	*	*			
Rome	<i>Aeneid</i> ¹⁸¹	*	*	*	*			
China	<i>3 Kingdoms</i> ¹⁸²		*	*				
Japan	<i>Tale of Genji</i>		*	*				
Italy	<i>Commedia</i> ¹⁸³		*	*				
Persia	<i>Shahnameh</i> ¹⁸⁴		*	*	*			

Figure 11. Advanced culture: when a major text, religious or secular, becomes the basis for expressions in other media. Note how these media tend to be static in the West (fine arts) and dynamic (performance arts) in the East.

Such a systematic approach will become the more significant when it can also become comparative, namely, when we can compare cycles of the Life of Christ with cycles of the lives of the Apostles and the lives of the Saints, such that we can trace how one country gives more attention to Christ and/or his Apostles (the beginnings of Christianity), while others devote more attention to the various saints (the later history of Christianity).

This approach can readily be extended to the Far East with respect to Buddha. How do cycles of the Life of Buddha in India differ from those in China, Japan, Myanmar (Burma) and Thailand? How do these vary in different media? Are there parallels between the developments in these cycles in the East and those of the West or do they follow completely different trends? These are kinds of questions, which we cannot begin to answer at the moment because we do not have a sufficiently comprehensive survey of the material. Such new comprehensive surveys are one of the important potential contributions of digital culture. Thus the new electronic media will allow us to ask new questions about hitherto disparate materials and lead to more comprehensive understanding of hitherto invisible patterns of cultural expression.

That which applies to Christ and the Buddha can be applied to all the other protagonists in the world's great religious and literary texts. Indeed, since all advanced cultures have great literature this principle is equally applicable to the other great cultures of the world (cf. figure 11). This will lead to a new kind of comparative cultural history, with a number of novel questions. How does the number of key episodes in the Life of Christ and Buddha compare with those in the Life of Lao Tse, Confucius and other religious leaders? How do the key episodes in mythological series, religious series and literary epics compare? In such domains the questions of art history will link with those of comparative literature as well as comparative religion. Why do some cultures prefer

1	Urban	Cities with Awareness	Beijing, Cairo, Istanbul, London, Paris
2	Regional	Provinces, Sections in Countries	Basque, Limburg)
3	National	Traditional Countries	France, Scotland
4	“ “	Recent Countries	Esp. Africa, South America
5	Multicultural	Large Countries and Units	Canada, Russia, United States, Europe)
6	International	Major Literature, Art	Shakespeare, Tolstoy, Leonardo)
7	“ “	Major Religions	Buddhism, Hebraism, Christianity, Islam

expressions in the fine arts whereas others prefer those in the performing arts? Are these preferences linked with the degree and type of literacy (i.e. manuscripts vs. printed communication)?

A comprehensive map of culture will need to distinguish between at least seven different levels ranging from local to international (figure 12). Cities with long histories such as Beijing or Cairo have their own local culture through experiences shared only within that city. Peoples in regions, often in the form of provinces, such as the Basques in Catalonia or the Quebecois in Canada, have their own cultural expressions through shared experiences in a language that separates them from other parts of the country in which they live. National cultures will vary greatly depending whether they have evolved over the centuries as in the case of Scotland, or whether they entail very recent nations which may not reflect the boundaries of a given tribe or people (as in parts of Africa or the former Yugoslavia). Very large countries such as Canada and Russia entail multicultural dimensions, which are a class unto themselves.¹⁸⁵

At the international level, major religions form the most common context for shared experiences. Finally, there is a corpus of world cultural heritage of major literature, art and other expressions, to which UNESCO is drawing our attention, which belongs to us all. These include natural wonders such as Ayers Rock in Australia, the Victoria Waterfalls in Africa, and Mount Everest in Nepal. It is this list on which we must build: of things we have in common, of experiences all humans can share, not only as tourists, but also as part of our collective imagination. For these can serve as bridges between the different levels and forms of culture in helping us arrive at a new map of culture, which allows us to see larger patterns in the expressions within the global village.

In the past it was generally assumed that culture was something monolithic. This arose largely from the assumption that one's culture defines one's person and one's being. A key insight which needs to be learned is that one and the same person can potentially operate in terms of all these different levels of culture without any necessary contradiction. I can participate in the local culture of more than one city (e.g. Toronto, London, Maastricht), be proud of my regional roots (e.g. Frisia), follow a particular religion (e.g. Christianity), participate in national cultures (e.g. Canada, Netherlands) and still be very enthusiastic about aspects of international culture. In the past such awareness was open only to a handful of international diplomats and merchants. In the future more and more of us need to learn these multiple dimensions of awareness. For therein lies a key to future tolerance.

Unfortunately our political structures are not yet aligned with these needs. In traditional political structures, culture was typically at the state (or provincial) or the national level. In Germany, for example, culture was at the state level (*Hoheit der Länder*) which made it very difficult for the national government to encourage international co-ordination. Other countries such as France¹⁸⁶, where culture is very much a national matter, frequently attempted international links after too little consultation with provincial bodies. Needed are new levels of co-ordination whereby it is recognized that efforts at the urban (local), regional and national levels need to be integrated with multicultural structures such as the European Union and international efforts at the level of UNESCO. If we are to have global citizens we need political structures to integrate various levels of their activities.

Ordering

As indicated earlier the relative importance of the goals will vary in different cultures. In early Greek art, for instance, ordering seems to have played a greater role than in the later periods when imitating (mimesis) became a dominant goal. One of the fascinating histories to follow is how a particular motif such as the meander fret which has a purely ornamental role of ordering within the Greek tradition, is taken up within the Christian tradition where its ordering function serves to frame and separate elements in religious cycles of the Life of Christ (e.g. the Reichenau) and thus linked with the goals of imitating. In a similar way the same motif becomes linked with the goal of matching during the Renaissance. Hence in addition to the individual histories of the goals, there is a further history of increasing interplay between the goals.

Given the iconoclastic strain within Islam, it is not surprising that the goal of ordering acquired special significance within that tradition. In some cases there are clear parallels between the patterns of Greco-Roman art and those of the Islamic tradition. We know also that the Arabic geometrical patterns which were developed at Granada served as a direct inspiration to Western artists such as Maurits Escher. Given the high regularity of these patterns this is a domain where pattern recognition techniques being developed in products such as IBM's Query By Image Content (QBIC) could reasonably be combined with agent technologies in order to make first steps towards an automatic "history" of dissemination and influence in the realm of ornamental forms which we class as ordering. In the longer term, of course, we need not just the isolated pattern, but also its context, especially in the case of complex architectural sites such as Isfahan.

Imitating

We have indicated briefly how, in the Western tradition, art played a role in establishing a greater aesthetic distance with respect to the physical world. Precisely how this happened differed greatly in different parts of Europe and yet here again there were larger trends. The fifteenth and sixteenth centuries, for instance, saw a particular interest in visualising proverbs and sayings in the form of emblems and imprese. These sometimes involved visual puns. While very widespread the use of emblems was largely a fashion at court, something which adorned one's hats and clothes, about which one published

manuals and yet not something which had a fundamental impact on high art. Emblems thus remained a specialised and slightly obscurantist chapter in the history of symbolism.

By contrast, within the Chinese tradition there was a particular fascination in the way one could take a sound for one word and visualize its homonym in order to create visual puns. Thus the word for happiness was represented visually by its homonym as a bat. The word for 10,000 had as its homonym the swastika. Hence a bat with a swastika signified: May you have happiness ten thousandfold. What makes this practice special in China, however, is that it permeates the whole of their society. For instance, once one recognizes the bat symbolism one finds it everywhere, including the five bats which are likely to adorn the rice bowl in one's local Chinese restaurant. Such visual puns become linked with the ordering principle such that one finds ornamental bat patterns, abstract versions of which make their way back to the West in the form of handles on chests of drawers.

Matching

Within the goal of matching there is another untold history, which requires much more study. In the West, there has been a general assumption that the great work of art is unique. Thus Leonardo's *Mona Lisa* in the Louvre is a "proper" subject of art history because it is "high art." Meanwhile, the hundreds of copies, variants and versions of *Mona Lisa*, were deemed to be "low art" and therefore were not considered as being within the purview of official art history. Only gradually are we becoming aware that it was precisely because of these copious copies and versions in low art that the masterpieces of high art were able to reach their status as icons of culture. In short, without thorough knowledge of copies and versions there can be no deeper understanding of why certain paintings and sculptures have become so central to our cultural heritage.

Again, one of the important differences within the Chinese tradition is that copies and versions play a far greater role within this cultural tradition. Hence, whereas the West has increasingly praised the copying of Nature above the copying of art, the Chinese tradition has long fostered a copy of art, of an exemplar as being equally and sometimes more worthy than a quest for uniqueness. Nor is this attitude limited to China. It pervades much of art and culture in the Far East. Countries where change is not a goal or an ideal clearly need to be studied along different lines than those where change is the dominant theme.

At present Westerners make many generalizations about the East most of which are based on ignorance. It is typically claimed, for instance, that the East developed no serious commitment to scientific drawing, which reflected the natural world in a reliable form. A wonderful Tibetan manuscript, recently published by Professor Parfionovich and colleagues, provides very dramatic evidence to the contrary, with thousands of painstaking drawings of plants, minerals and other items relating to medicine, namely, a Tibetan book of medicine.¹⁸⁷

As mentioned earlier (cf. also figure 11 above), yet another characteristic of the Far East is a far greater emphasis on the performance arts as a means of expressing religious and

cultural traditions. Such aspects also exist in the West, if one thinks of the mediaeval mystery plays, which are still continued in the cycles in towns such as York and Oberammergau. Even so, partly as a reflection of limited bandwidth, Western websites of cultural heritage are very markedly focussed on the static aspects of that tradition with thumbnails of paintings and sculptures. In future we need to use multimedia to reflect adequately the enormous richness of these performance dimensions of culture particularly in the East. Here the pioneering work of Ranjit Makkuni offers an example of what lies ahead.¹⁸⁸

Influences

Thus far histories of art/culture have focussed on influences within the West, for example, how Byzantine art influenced mediaeval art, how themes of the Greco-Roman tradition were taken up anew in the Renaissance -- which became a leitmotif of Aby Warburg's institute. To be sure the importance of Alexander the Great in spreading Hellenistic art to the Far East such that the Greek god Apollo unwittingly became a model for versions of the Buddha. Carl Gustav Jung's fascination with archetypes led to a remarkable collection of 50,000 images now in the Warburg Institute in London.

The question of cultural influence needs to be studied at a global scale. Most persons in the West know of the vast scale of Versailles -- which led to literal imitations at Salzdahlum in Lower Saxony and imaginative variants in the form of Schönbrunn (Vienna). Yet few are aware that the idea of working on such a vast scale resulted from visits to Pagan (Burma) and Angkor Wat (Thailand) by ambassadors of Louis XIV. These two cities of the East, the largest planned cities in human history, were thus an inspiration behind one of the most famous monuments of the West.

It is generally acknowledged that Dutch culture had a great impact on Japan. In the seventeenth century, Dutch trade brought Delft blue ceramics to Japan. In the eighteenth century the same channels appear to have introduced linear perspective to Japan. But then in the nineteenth century Japanese art, in turn, had a great impact on the European Impressionists as did the so-called primitive art of Africa in the early twentieth century. Such examples are generally acknowledged but there is much more to be done.

If one goes to the major galleries of the former colonial countries one discovers that there is an untold history which begins with simple importation and leads to something very different. Landscape offers an excellent example. In Sydney, for instance, one can trace how the early artists merely imported the landscape traditions of England and Scotland. Indeed, early paintings of Australia, could well be mistaken for views of the Lake District or some other feature of the English countryside. Only gradually does the art reflect the uniqueness of the Australian landscape. A similar story can be told for Canada, South Africa and other colonies. That which applies to landscape applies equally to other cultural expressions. If one thinks of the Portuguese and Spanish colonies in South America, one could write a similar history in terms of religious architecture. A similar story could be told regarding the literature of these countries.

Low and High Culture

In this paper we have deliberately focussed on high culture for a simple reason. High culture, with its clear links to a written and usually published corpus, is more reliable in guaranteeing both the continuity and cumulative growth of shared experiences which we claim are central to all advanced forms of culture and civilization.

Nonetheless, we have acknowledged the need to study the interplay between so-called high and low culture. The rise of anthropology, ethnography, sociology and more recently, semiotics, have made us ever more aware that popular culture in the form of festivals, parades, processions, be they religious (Easter Week in Spain), nationalistic (the St Patrick's Day parade), linked with sports (the Orange Bowl football parade), steeped in history (the Palio in Siena and other Italian cities) or secular (Santa Claus parade), offer us many insights into culture.

For our purposes two anecdotal examples will suffice. In San Gimignano there is a long-standing tradition of processions with floats in Lent during the weeks prior to Easter. In 1991 during the Gulf War there were floats with a caricature of Saddam Hussein whose official links with the *New Testament* and Christianity are minimal. In Maastricht there are also annual processions with floats on the occasion of Carnival week. In 1999 there was a float dedicated to hippies and free love in a culture where this would at best be seen as a curiosity rather than as a directive for a life style.

Needed clearly is an inventory and study of how these shared experiences, ranging from Mardi Gras and Carnival to the major sport events contribute to different levels of shared cultural experience. In the case of the Carnival at Venice or the *Palio* in Siena these events are closely linked with the culture of a special city. In the case of Olympic games, in theory, there are reflections of world culture as well as the particular emphasis provided by the host country. In a world where some of these events are being broadcast globally, we need a global picture of such phenomena.

Culture as Diversity of Media

If we stand back for a moment, the quest for a world chart of culture can lead us to new insights concerning cultural complexity and richness. If culture relates to shared experience then it follows that language, magic, religion are obvious starting points for all cultures. As long as these expressions remain oral, they are limited to a relatively small area dominated by a given tribe or group. In other words, oral cultures tend to remain primitive because they are not set down and "fixed" by the written word and as such they are not readily transmitted over large distances except in cases where a very forceful leader, usually a dictator such as a Tamerlane, has imposed a view over a large geographical area.

Cultures which are written, which have a written text as their basis, be this the *Bible* or the *Koran* (the followers of Islam are known as the people of the book), mark a next stage

in this evolution, for now the ideas can spread to far off places, frequently in the absence of violent dictatorial force.

Anthropologists such as Goody¹⁸⁹ have shown that a written text "fixes" the text and establishes a certain uniformity in the heritage that persons share. As we have noted earlier, however, in our analysis of Christian frescoes, it is precisely this fixing, in the sense of pinning down the text which makes it more widely known and these best known stories, in turn, are paradoxically, those which become the most widely used. Everyone knows the *Last Supper*, so the *Last Supper* becomes one of the central themes of Christian art and culture (cf. figure 15). Similarly in Persia everyone knows the stories of Majnun and in India everyone knows the stories of Arjuna and so it is these stories which become central to cultural expression.

In a primitive culture a totem is typically limited to one medium, such as stone or wood. Multiple media would impinge on the efficacy or even the validity of the totem. In advanced cultures this criterion is reversed. A given theme is important precisely because it inspires copies, versions, variants and even caricatures in as many media as possible. The *Last Supper* is great because there are full size fresco copies of it, wooden models of it, plastic toy versions of it and even Hollywood spoofs of it. Similarly Mona Lisa is great partly because it inspires every imaginable variation from careful copies, to caricatures of all kinds and even towels and pillow cushions. Expressions in multiple media thus become an empirical way of approaching highly developed cultures. The more expressions of a shared theme or topic, the higher the culture. In this model China and India emerge as important in their own right as high culture, even though as we have seen, expressions may occur in different media: one emphasizing examples in performance arts, another emphasizing examples in the fine arts.

A fourth dimension of culture relates to degrees of technical reproduction, a phenomenon to which Walter Benjamin drew attention in his now classic essay: *The Work of Art in the Age of Mechanical Reproduction (Das Kunstwerk im Zeitalter seiner technischen Reproduzierbarkeit)* (1936).¹⁹⁰ This is a dimension where the advent of digital (versions of) culture through the Internet is bringing great changes, because works which were once spread through limited editions can now potentially give access at an international level. For the moment, due to the preponderance of technical reproduction in the West, Western culture often seems more dominant than it deserves to be. But as we have seen (p. 40 above) this trend is changing rapidly.

Thus the map of world culture would have at least four layers with inventories or catalogues of: 1) shared oral beliefs, ideas, stories, pantheons, cosmologies linking persons in a given tribe, group, or cultural entity -- which may have been recorded in writing by persons external to that group; 2) key stories which have been recorded in written form by the members of a cultural community (cf. figure 11 above); 3) all the artistic media which have been used to express those stories and 4) all the technical reproduction media which have been used to make accessible these artistic expressions (cf. figure 15 below).

An important challenge will be to link this map of world culture with changing values. Those items which a given culture finds important are put into museums. Yet only a small percentage of what is in the museums is on display. We need new ways for visualising not only the actual contents on display, but also how those contents keep changing. The Louvre today displays different things than it did in 1800 or in 1700. So we need virtual museums of what was and ways of seeing how what was/is on display at any given time relates to what is not displayed.

6. New Meta-Data

If our goal is truly a systematic access to culture in all its forms, we need a system that includes art in museums, texts in libraries and archives, performances in concert halls and theatres as well as other sources on the Internet. In spite of many important initiatives such as the Dublin Core, the Resource Description Format, the Interoperability Forum and many metadata initiatives we are not in a position to do this today. For the purposes of this paper three simple figures will suffice to make our initial point.

We shall begin with a relatively "simple" contemporary event, which could either be negative as in a plane crash or positive in the case of some triumphant parade or festival. At the local scene all the details of this event will be recorded. We will read in the local paper of who was killed, who their families were, how this has affected their neighbours, their colleagues at work and so on. At the regional level the same event will be recorded as a plane crash and a smaller number of details concerning the most important crash victims will be provided (figure 13). At the national level, there will be a more matter of fact report of yet another plane crash. At the global level, the actual event is not likely to be described. Rather we shall probably witness a tiny fluctuation in the annual statistics of persons who have died. In historical terms, say the statistics concerning deaths in the course of a century (what the *Annales* School might call the *longue durée*), this fluctuation will become all but invisible.

This example points to a first fundamental problem concerning meta-data. Those working at the local, regional, national and historical levels typically have very different foci of attention, which are frequently reflected in quite different ways of dealing with, recording and storing their facts. The same event, which requires many pages at the local level, may merely be recorded as a numerical figure at the historical level. Unless there is a careful correlation among these different levels, it will not be possible to move seamlessly through these different information sources concerning the same event.

Implicit in the above is also an unexpected insight into a much debated phenomenon. Benjamin Barber, in his *Jihad vs. McWorld*,¹⁹¹ has drawn attention to a seeming paradox that there is a trend towards globalizations with McDonalds (and Hiltons) everywhere and yet at the same time a reverse trend towards local and regional concerns as if this were somehow a lapse in an otherwise desirable progress. Looking at the above diagram (figure 13) it becomes clear why these opposing trends are not just a co-incidence. Clearly we need a global approach if we are to understand patterns in population, energy and the crucial ingredients whereby we understand enough of the big picture in order to

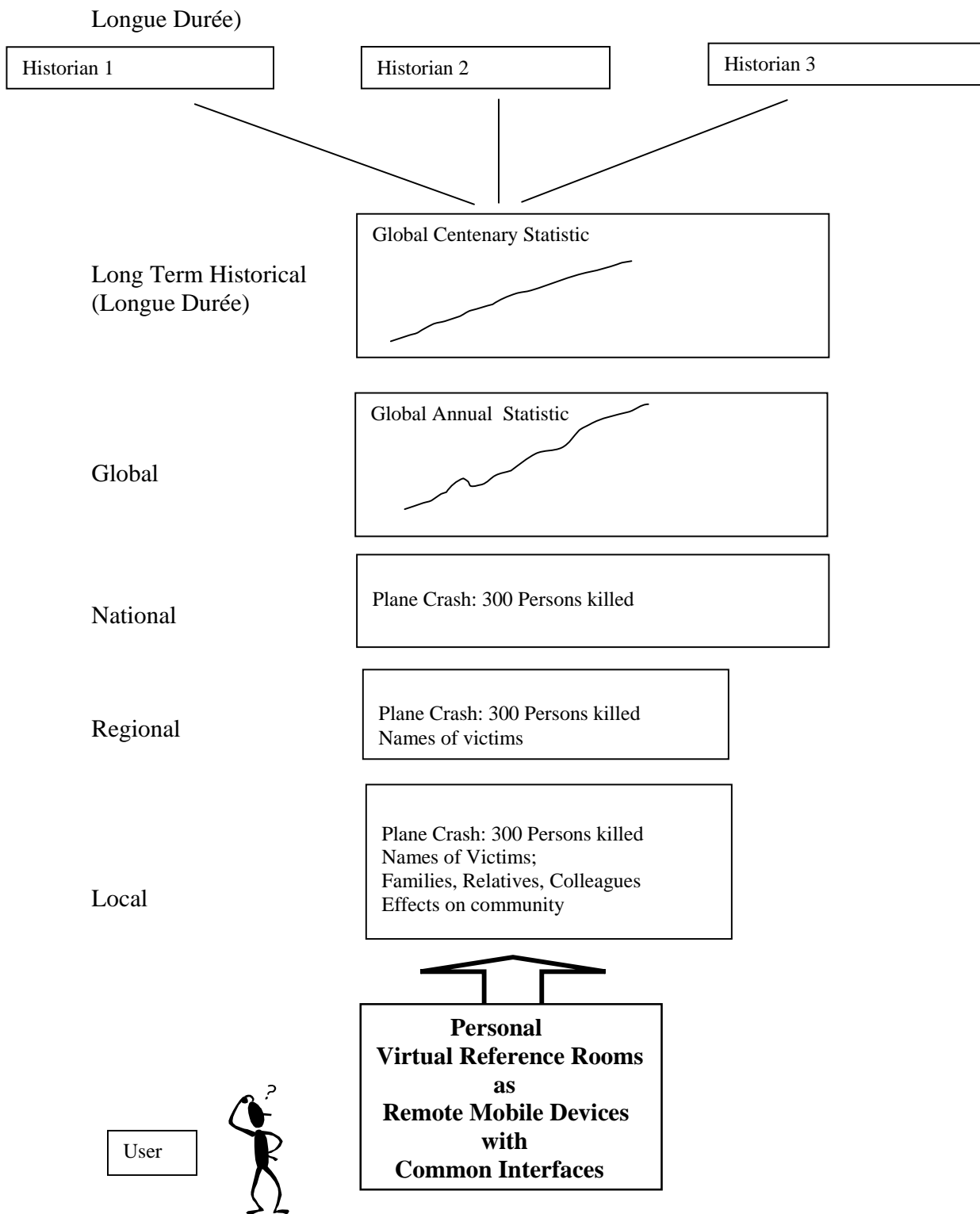


Figure 13. Access to different resolutions of detail re: a single event.

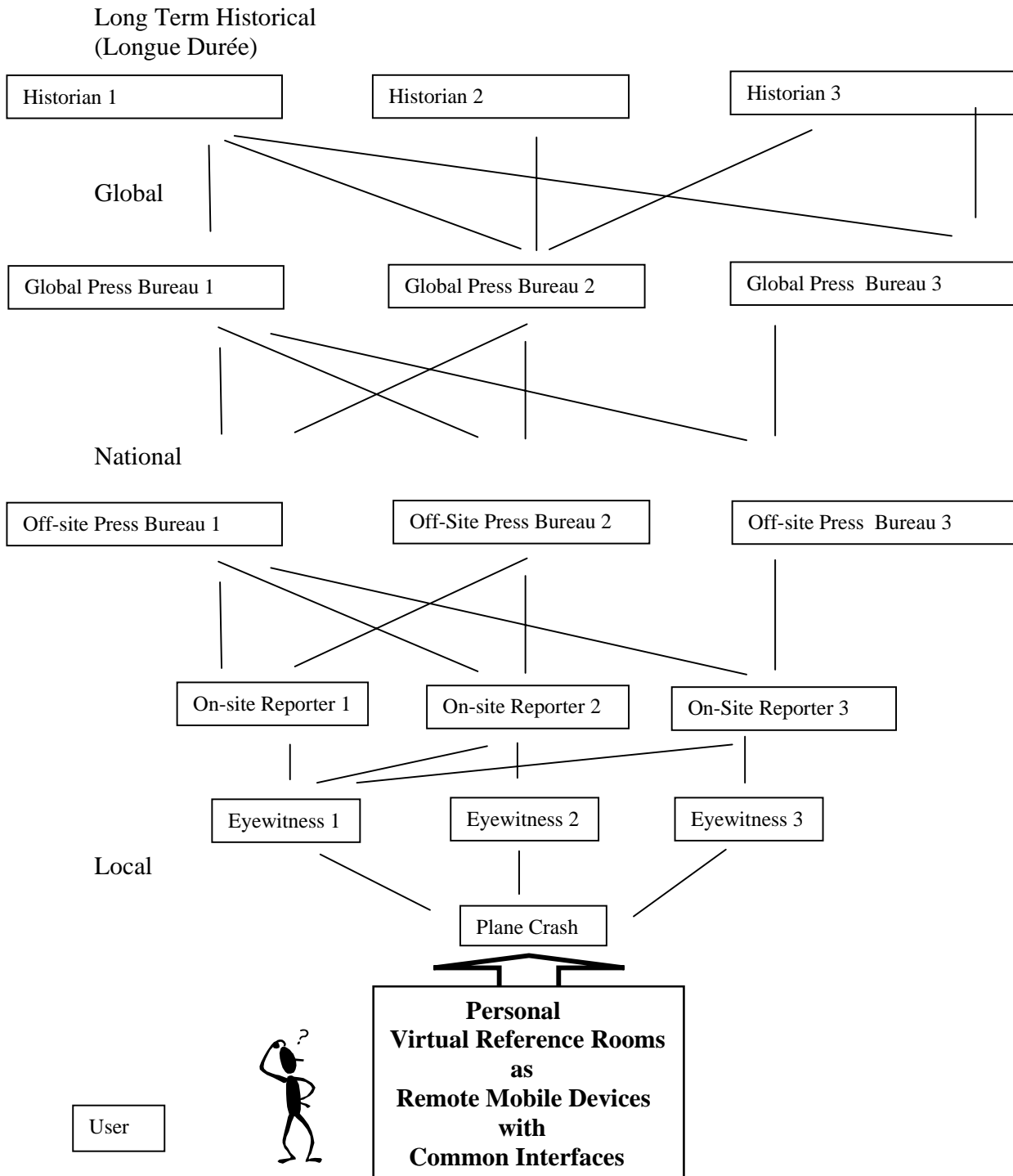


Figure 14. Access to versions of a present event through narrative context.

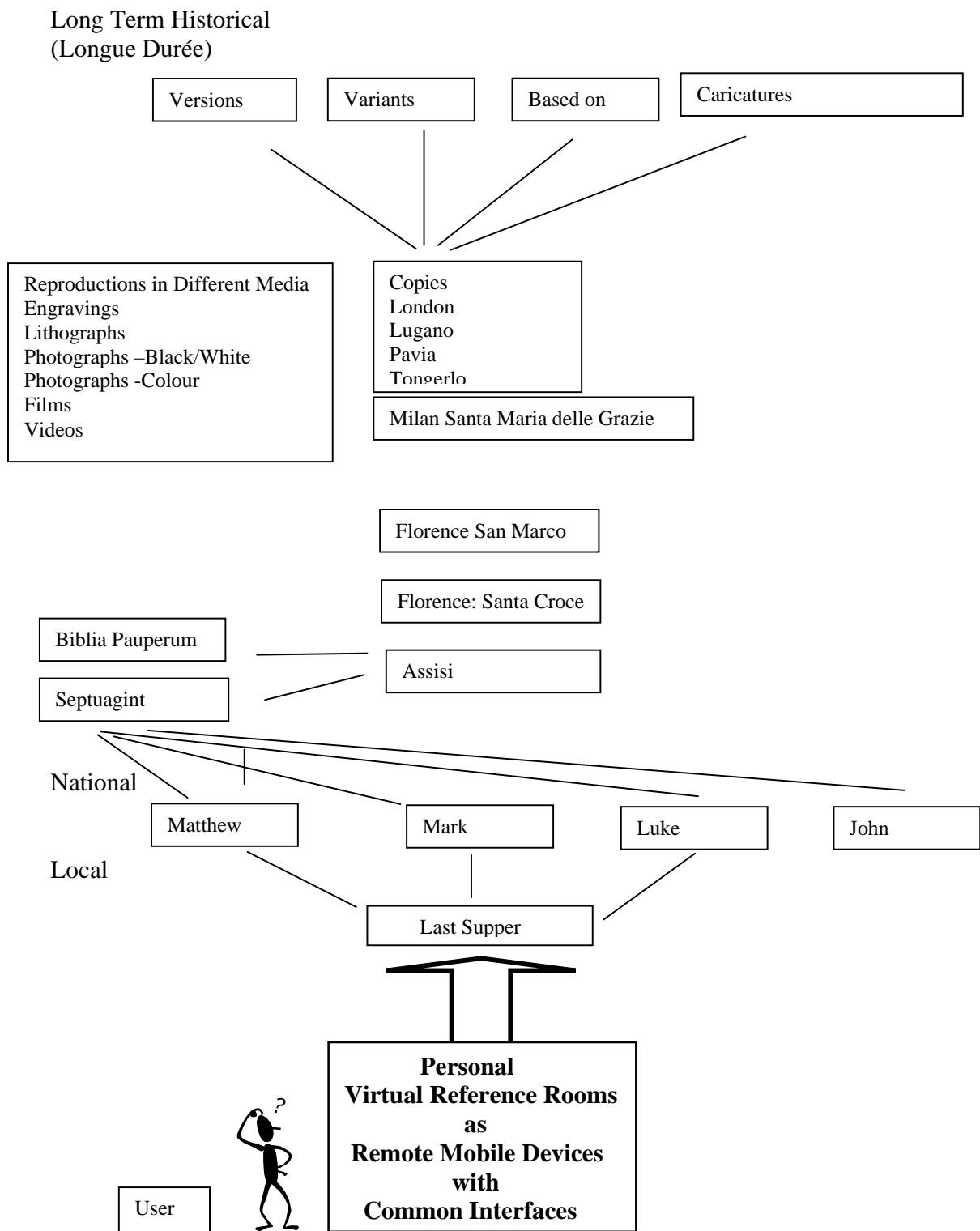


Figure 15. Access to different versions of a past event through narrative context.

render sustainable our all too fragile planet. But this level, however important, is also largely an abstraction. It reduces the complexity of the everyday into series of graphs and statistics which allow us to see patterns which would not otherwise be evident.

Yet in that complexity, are all the facts, all the gory details which are crucial for the everyday person. Thus trends towards CNN are invariably counterbalanced by trends towards local television, local radio, community programmes, local chat groups on the Internet. This is not a lapse in progress. It is a necessary measure to ensure that the humane dimension of communication remains. In retrospect, Marshall McLuhan's characterisation of this trend as one towards a "global village" is much more accurate because it acknowledges the symbiotic co-existence rather than the dualistic opposition between the two trends.

To return to the problem of meta-data the problem becomes clearer if we pursue the hypothetical case of a plane crash from a slightly different point of view (figure 14). At the event there are usually eye-witnesses. For the sake of our illustration let us posit that there are three. There will also be on-site reporters who may not have been eye-witnesses. Again we shall posit three. They send their material back to (three) off-site press bureaus. These gather information and send them on to (three) global press bureaus. This means, that in our hypothetical example, the "event" has gone through some combination of 12 different sources (3 eyewitnesses, 3 on-site reporters, 3 off-site press bureaus and 3 global press bureaus, ignoring for the moment the fact that the latter institutions will typically entail a number of individuals). When we look at the six o'clock news on the evening of the event, however, we are usually presented with one series of images about the event.

It may in fact be the case that all twelve of the intermediaries have been very careful to record their intervention in the process: i.e. the meta-data will often be encoded in some way. What is important from our standpoint, however, is that we have no access to that level of the data. There is usually no way of knowing whether we are looking at eyewitness one as filtered through on-site reporter two etc. More importantly, even if we did know this, there would be no way of gaining access at will to the possibly conflicting report of eyewitness two, on-site reporter three and so on. There may be much rhetoric about personalisation of news, news on demand, and yet the reality is that we have no way of checking behind the scenes to get a better picture.

Some may object that such a level of detail is superfluous. Often this is true. If the event is as straightforward as a plane crash all that is crucial is a simple list of the facts. But the recent bombing of the Chinese Embassy in Kosovo offers a more complex case. We were given some facts: the embassy was bombed but not told how many person were killed. We were told that the Chinese objected as if they were being unreasonable and only many weeks later were we told that this had been a failed intervention of the CIA. Until we have useable meta-data which allows us to check references, to compare stories and arrive at a more balanced view, we are at the mercy of the persons or powers who are telling the story, often without even being very clear as to who is behind that power. Is

that satellite news the personal opinion of the owner himself or might it represent the opinions and views of those in whose influence they dwell?

The problems concerned with these contemporary events fade in comparison with historical events, which are the main focus of our cultural quest. It is generally accepted that in the year 33 A.D. (give or take a year or two depending on chronology and calendar adjustments) there occurred an event, which might be described as the most famous dinner party ever: the *Last Supper*. From a contemporary standpoint there were twelve eyewitnesses (the Apostles) of whom four were also the equivalents of on-site reporters (Matthew, Mark, Luke and John). In today's terms, their reports were syndicated and are better remembered as part of a collection now known as the *New Testament*. That work went through various editions until it was revised as the *Septuagint* – a collation of all the reports of the time minus the meta-data tags. Popular versions with less texts and more pictures were also produced: expurgated equivalents of a Daily Mirror known as the *Biblia pauperum*.

The theme was then taken up by the Franciscans in their version of billboards -- without the advertising fees – known as fresco cycles. This idea developed in Assisi was marketed in their Florentine branch known as Santa Croce where the idea caught on and soon became the rage, so much so that the Dominicans soon used it in San Marco and elsewhere including the church of Santa Maria delle Grazie where Leonardo da Vinci gave a new twist to what had by now effectively become the company slogan. The idea soon became part of the Church's international marketing strategy. Copies appeared on walls as billboards, or rather, paintings in Pavia, Lugano, Tongerlo and eventually London. As part of the franchise strategy multi-media was used. So there were soon reproductions in the form of engravings, lithographs, photographs, three-D models, and eventually even films and videos. In the old tradition that imitation is best form of flattery, even the competition used the motif, culminating in a version where Marilyn Monroe herself and twelve of her Hollywood colleagues made out of the *Last Supper* a night on the town.

As a result of these activities in the course of nearly two millennia, there are literally tens of thousands of versions, copies and variants of the most famous dinner in history, which brings us back to the problems of meta-data. If I go to one of the standard search engines such as Yahoo or Altavista and type in *Last Supper*, I am given an indiscriminate number of the tens of thousands of images concerning the event, which happen to be on-line, or to speak technically, a subset of somewhere between 10 and 30% of that amount which have been successfully found by the leading search engines.

There is no way of limiting my search to the text versions of the original reporters, to large scale wall sized versions in the scale of Leonardo's version which was eight by four meters, let alone distinguish between Franciscan and Dominican versions, authentic copies as opposed to lampoons, caricatures and sacrilegious spoofs. To a great expert requiring a system to find such details might seem a little excessive because they might know most of these things at a glance. But what of the young teenager living in Hollywood who, as an atheist, has no religious background and sees the version with

1	Individuals and Concepts	classification of term
2		single term of an individual
3		single text of an individual
4		corpus of an individual
5		quality of corpus
6	Objects/events	resolutions and layers of image in one medium
7		resolutions in detail from local to global
8		copies, versions etc. of same image
9		relevant maps with boundaries adjusted over time
10		relevant calendars with instant conversion to equivalents
11		versions etc. of present event
12		versions etc. of past event.

Figure 6. New kinds of meta-data needed to achieve multimedia access to the world's cultural heritage.

Marilyn Monroe for the first time? How are they to know that this a spoof rather than something downloaded from a fifties version of CNN online? A true search engine would help not only the young Hollywood teenager but also help every true searcher. Indeed it should provide truth even if the searcher is "false."

To achieve these will require more than quick fixes. Entailed is much more than scanning in all the evidence. It goes without saying that the system must reflect all the languages of the world, which is becoming possible through Unicode. We need the materials in some form equivalent to Standardized General Markup Language (SGML). As was noted earlier (figure 7), we need to be able to take a term or concept and contextualize it. We need to be able to go from any term to all the ways in which it appears in different classification systems and thesauri. We need to be able to trace how an individual author uses that term, to consult the given texts of the author in which that term occurs in all their versions and editions. Similarly we need access to the history of the corpus of texts by an author, with reference to the different ways they were received. (Just as there are fashions in clothes there are fashions in the way authors are appreciated. There were periods in the past few hundred years where even Leonardo da Vinci faded out of the public eye). Ultimately we also need access to information about the quality of the interpretations we are consulting. (Is the person who claims Leonardo was insignificant qua his contribution to science, someone who has actually read the texts?). For access to changing cultural/historical interpretations of Individuals and Concepts as well as of Objects and events we need new kinds of metadata (figure 16).

With respect to objects we need a systematic correlation of all images concerning them, in all their resolutions, in all the layers of the object (through methods such as infrared reflectography), as well as all the copies and versions of those paintings or objects. We need not just contemporary maps to show us the locations of these objects but also historical maps which reflect the changing boundaries of countries over time. (As a result a query about Poland in the fourteenth century will search a different area of

Grammar	Structure	Inflexional forms, Syntax	SGML, XML
Dialectic	Logic	Search for truth of statement Semantic=Meaning=Semasiology	RDF VHG
Rhetoric	Effect	Expression, Style	CSS/XSL

Figure. 17. Links between the ancient *trivium* and recent Internet developments

Europe than a query about Poland in the twentieth century). We need adjustable chronologies. And as noted in the diagrams above (figures 13-15) we need seamless movement among resolutions in detail from local to global; different versions, etc. of a present event and versions etc. of past event. To achieve this new form of meta-data a long-term project within the European Commission may be necessary.

In the early days of literacy in the West, a series of rules for the use of language evolved. This gradually led to the fields of grammar, (which dealt with the structure), dialectic, (which dealt with the logic) and rhetoric (which dealt with the effects of language). Together grammar, dialectic and rhetoric became the *trivium*, the humanities side of the seven liberal arts (which had its proto-scientific side in the *quadrivium* of mathematics, arithmetic, astronomy and music).

When the Internet began in 1969 it was intended primarily to provide new ways for humans to communicate at a distance. In the past decades, have seen the emergence of a new challenge for the Internet: to provide new ways for machines to communicate with each other without the intervention of humans. This quest helps to explain why the theme of meta-data has become central to the world of computers. In the process it is instructive to note that groups such as the World Wide Web Consortium and the Internet Society are effectively engaged in re-formulating in electronic form, the rules of grammar, dialectic and rhetoric. The syntax aspects of grammar are covered by Standardized Graphical Markup Language (SGML) and eXtensible Markup Language (XML). Recent developments with respect to a Virtual Hyperglossary (VHG)¹⁹² are addressing semantic elements of dialectic. Elements of expression and style relating to rhetoric are being covered by Cascading Style Sheets (CSS) and eXtensible Style Language (XSL, cf. figure 17). In other words, the Internet is not just about scanning in our cultural objects and other bits of content. It is also about finding electronic equivalents for all our rules and definitions of knowledge.¹⁹³ And ultimately it is changing our conceptions of knowledge itself. The challenge that faces us is to ensure that these transformations reflect all the diversity of our being rather than reducing us to the limitations of some algorithm. That is why the goals of culture and art are so essential for our future.

7. Conclusions

This paper began by considering the range of content included under the term culture, noting that in the West it is often limited to the fine arts and the performing arts as if these two were in opposition. A survey at the world level revealed that culture includes a number of other elements. This led to a discussion of six basic goals of cultural and artistic expression, namely, connecting (sometimes called the magical function in

primitive art); ordering (or ornament); imitating (or mimesis); matching; mixing and exploring. A more detailed study of these goals led to a series of further distinctions, which led us to reconsider some of the main trends of Western art. We showed that these concepts, when approached in the context of the history of literacy, helped us to understand the role of art and culture in terms of increasing levels of aesthetic distance or abstraction. We showed also how a particular commitment to the goal of matching helps to explain an emphasis on linear perspective in much of Western art. An understanding of the five other goals, which were more widely developed elsewhere, helps us to understand why other cultures often chose cultural expressions without linear perspective.

The next section turned briefly to four global threats to culture, namely, unstable politics, some recent trends in global business, notions of evolution involving memes and simplistic trends on the Internet. Section five outlined the need for a world map of cultural values, and sketched how the six goals of culture might be adapted in creating a global approach to culture, which led to consideration of some of the problems concerning meta-data implicit in such a quest.

Throughout this paper, our purpose was to explore a framework which will allow a balanced study of all cultures in order that we can approach seriously the challenges posed by seeking Multimedia Access to World Cultural Heritage. In so doing the reader will have discovered that the challenges facing us are far more daunting than the task of scanning in our cultural artifacts and eventually the whole of human knowledge. The real challenges lie in including the complexities of our languages, our local traditions, our different viewpoints, even our differing ways of approaching truth. The task is monumental. It will be enormously difficult. But then who ever said that being a member of the global village in its deepest sense was easy?

The late Professor Gina Fasola used to say, half facetiously, that culture was what remained when we had forgotten everything that we had ever learned.¹⁹⁴ From a global point of view, culture is central to the collective memory of mankind.¹⁹⁵ This cumulative wisdom of our past is our key to future diversity and complexity. To keep this intact and develop it is difficult. To understand the goals of culture and art is very difficult. But are there more noble goals if, as may prove to be case, in the future of culture lies the future of humanity?

Acknowledgements

I am very grateful to the International Institute of Communications (IIC, London) for their invitation to develop the ideas in this paper. These ideas are the author's personal attempts to understand a bigger picture. They do not reflect the official position of the IIC or any other body.

Readers may recognize an interplay of two quite different intellectual traditions which have inspired the fundamental approach in this paper. On the one hand, the Warburg Institute has inspired a vision of a systematic approach to our cultural heritage. To Sir Ernst Gombrich, my former teacher, who was also the Director of the Warburg Institute, I

owe the fundamental insight that we need to understand multiple goals of culture and art: that art cannot be reduced to some naïve single line of progress and evolution.

On the other hand, the idea of using the history of literacy as a means of throwing light on different aspects of culture was inspired by the late Marshall McLuhan and the ideas of what has been called the Toronto School of Communication and includes the ideas of Eric Havelock, Harold Innis, Walter Ong, Brian Stock and Eric McLuhan. The role of abstraction and aesthetic distance in this process has grown out of the author's long studies of perspective. Indeed, the section on European goals of culture has been adapted from a much longer study on the *Sources of Perspective* and on the *Literature on Perspective*, which will accompany a two volume, standard bibliography of the field.

Some useful references were kindly provided by Dr. Gerard Budin and Heiner Benking. Professor Mohindar Partap very kindly read this essay which has grown out of research and conversations with friends over the decades including: Father John Orme Mills, Udo Jauernig, Eric Dobbs, André Corboz and many others. I am grateful to them all.

Notes

¹ *Ideas of Culture: Sources and Uses*, Edited by Frederick C. Gamst, Edward Norbeck, 1976. See also: Alfred Louis Kroeber, C. Kluckhohn, *Culture: A Critical Review of Concepts and Definitions*, Cambridge, Mass., 1952; Alfred Louis Kroeber, *A Roster of Civilizations and Culture*, New York: Greenwood Press Reprint, 1962. (Subscriber's edition distributed through Current Anthropology for the Wenner-Gren Foundation for Anthropological Research, Inc.). Cf. Horst Reimann, *Transkulturelle Kommunikation und Weltgesellschaft*, Opladen: Westdeutscher Verlag, 1992. Dan Sperber, *Explaining Culture: A Naturalistic Approach*, Oxford: Blackwell Publishers, 1996. Cf. the website of the Washington State University at <http://www.wsu.edu:8001/vcwsu/commons/topics/culture/culture-index.html#top>. See also Elvin Hatch, *Theories of Man and Culture*, 1973. Cf. Elvin Hatch, *Culture and Morality: The Relativity of Values in Anthropology*, New York: Columbia University Press, 1985; Robert M. Young, *Mental Space*, Process Press: London, 1994, esp. chapter 2: Cultural Space. For an important survey of contemporary problems concerned with culture see the site of the Union Internationale des Associations at <http://www.uia.org/uiademo/ndx/pro/pro83.htm>,

which has the following headings:

- Culture youth violence | (F)
- Cultures ; Disparagement indigenous | (E)
- Cultures ; Dying | (B)
- Cultures ; Endangered | (B)
- Cultures ; Homogenization | (B)
- Cultures ; Lack economic adaptation native | (E)
- Cultures ; Limited exposure | (F)
- Cultures ; Rapidly changing | (F)
- Cultures ; Rejection | (U)
- Cultures ; Temporal dissonance | (F)
- Cultures ; Unseemly nakedness tribal | (F)

Cultures ; Untransferability books countries | (F).

For an example of how the corporate world has very different definitions of culture see the discussion of culture under enterprise risk management at: <http://www.contingencyanalysis.com/erm2.htm>. Cf. footnote 126 below. For an excellent introduction to some of the larger policy issues involved in new media economics and media culture see the Economic and Social Research Council's site at: <http://www.strath.ac.uk/Other/MEMC/> which has the following headings:

- I. The Future of Media Industries
- II. The Regulation of the Media
- III. The Media, Democracy and the Nation State
- IV. The Media and the Public
- V. Corporate Organisation and Media Output.

The notion of cultural ecology, now a theme within the IIC goes back to Julian H. Steward, *Theory of Culture Change. The Methodology of Multilinear Evolution*, Urbana: University of Illinois Press, 1955, particularly chapter 2: "The Concept and Method of Cultural Ecology," pp.30-42. For an anthropological view see Clifford Geertz, *The Interpretation of Cultures*, New York: Basic Books, 1973. For a sociological approach see Margaret S. Archer, *Culture and Agency. The Place of Culture in Social Theory*, New York: Cambridge University Press, 1988, Revised 1996. Cf. Zygmunt Bauman, *Culture as Praxis*, London: Routledge and Kegan Paul, 1973. New Edition: London: Sage, 1999.

² See: <http://www.penncharter.com/Student/china/cult/index.html>

³ See: <http://www.unclctai.com/reference1/culture.html>

⁴ See: <http://www.arab.net>. I am grateful to Khalid J. Emara (Brussels) for this reference.

⁵ A Persian cultural site even has a section on ZanAmu - Foreign Wives of Iranians
See: <http://www.farsinet.com/indexc1.html>.

Some idea of the tremendous differences in approaching culture becomes evident from comparing a series of Internet sites reflecting different national cultures:

Australia <http://www.acn.net.au/disclaimer/>

China <http://www.cernet.edu.cn/resource/index.html>
<http://www.china-guide.com/index.htm>
<http://www.gio.gov.tw/info/culture/culture.html>
http://hzdf.zjpta.net.cn/chinese_culture/culture.html

Chinese sites typically include medicine and philosophy as part of culture.

There is also a site devoted specifically to an Agricultural Culture

Collection of China:

<http://www.im.ac.cn/institutes/accc/accc.html>

Finland <http://www.uiah.fi/internetguide/navfin.html>

Iceland <http://www.selfoss.is/husid/history.html>

Nordic <http://www.markovits.com/nordic/culture.shtml>

Persian <http://www.persian.com/>
<http://www.farsinet.com/indexc1.html>

⁶ See: <http://www.geog.fu-berlin.de/eurocis/whl/index.html>

⁷ MEDICI is an acronym for :Multimedia EDucation and employment through Integrated Cultural Initiatives.

See: <http://www.medicif.org>.

⁸ See: <http://www.unesco.org/whc/heritage.htm>.

⁹ See: <http://www.unesco.org/webworld/mdm/administ/en/guide/guidetoc.htm>.

UNESCO also has a programme for a Culture of Peace

See: <http://www.unesco.org/cpp/uk/>.

¹⁰ Many important bodies are now concerned with these aspects. This includes new organisations such as the Internet Society (particularly through its Internet Engineering Task Force or IETF), the World Wide Web Consortium (W3), led by the visionary Tim Berners Lee, who foresees the advent of a global reasoning web or semantic web and the Consortium for the Interchange of Museum Information (CIMI). It also includes groups within more traditional bodies such as the International Federation of Library Associations (IFLA) and sections of the International Committee on Museums (ICOM) particularly the Comité Internationale pour la Documentation de l'Art (CIDOC), i.e. International Committee on the Documentation of Art.

¹¹ Interoperability of content is being addressed at a number of levels. The European Commission has made the interchange of materials in museums, libraries and archives one of the leitmotifs of its Fifth Framework Programme. More specifically, interoperability of content is the foremost goal of a new European Network of Centres of Excellence in Digital Cultural Heritage, based at Maastricht, which is being developed in the context of the MEDICI Framework.

See: <http://www.mmi.unimaas.nl>

¹² See: <http://www.arab.net>

¹³ In China, for instance, performance arts include: acrobatics, dance, drama, festivals, kung fu, music (classic and popular), opera, and puppetry.

¹⁴ In the West, the *Bible* also inspired performance arts in the form of both theatre (mystery plays) and music (the Gregorian Mass and other hymns). This more or less popular tradition led to an ever more elitist approach culminating in Handel's *Creation*, *Messiah* and the *Masses* of Mozart and Verdi. By contrast in the East the great religious epics continue to inspire popular and "low culture" responses across the spectrum of performance arts.

As a whole the West has seen a curious tendency to limit the definitions of culture to high culture, dismissing the importance of popular and everyday culture. High art is the subject of art history: copies, versions etc. are low art and not the subject of art history. Or thus the rhetoric until recently. For a fascinating study of the rich resources available in popular culture in Italy see the study of Italo Sordi, *Teatro e rito. Saggi sulla drammatica popolare italiana*, Milan: Xenia Editore, 1990.

¹⁵ Matthew Arnold, *Dogma*, 1896, xiii according to the *OED*.

¹⁶ This is again quite different from what the French understand by the terms *culture et civilisation*.

¹⁷ My colleague Heiner Benking has kindly drawn my attention to a rather dramatic example of this difference between languages. A book by Samuel P. Huntington, *The Clash of Civilizations and the Remaking of World Order*, New York: Simon & Schuster, 1996 has recently been translated into German as *Kampf der Kulturen*. On this subject see also Roman Herzog, Amitai Etzioni and Henrik Schmiegelow, *Preventing the Clash of Civilizations: A Strategy for Peace for the Twenty-First Century*, 1999. Somewhat happier is Heinrichs' concept of *Gastfreundschaft der Kulturen*. Cf. the book by Norbert Elias, *Über den Prozess der Zivilisation*, Bern and Munich, 1969, 2 volumes, which was translated as: *The Civilizing Process*, vol. 1: *The History of Manners* and vol. 2: *Power &*

Civility. (both) New York, 1982. Cf. Norbert Elias, *On Civilization, Power, and Knowledge: Selected Writings*. Edited and with an Introduction by Stephen Mennell and Johan Goudsblom, HOS 1998.

Recently, postmodernists reading Kant via Adorno, tend to link culture with aesthetic and civilization with reason, and see the history of culture as a "making pleasurable of domination". See: Thomas Huhn, "The Kantian Sublime and the Nostalgia for Violence," *Journal of Aesthetics and Art Criticism*, vol. 53, 1995, pp. 269-275. In his approach, Huhn links civilization with aesthetic pleasure/domination and culture with reason.

¹⁸ It is significant however that that same society produced some amazing Victorians such as Captain Sir Francis Burton, who travelled throughout the middle East and India, throughout Africa, helping discover the mouth of the Nile as in Burton and Speke.

¹⁹ London: Deacon and Co., 1890. *The Wall Chart of World History*, drawn by Professor Edmund Hull, London: Studio Editions, 1988.

²⁰ A fuller study of this subject would have to examine in more detail the important distinctions introduced by Sir James George Frazer in his classic work, *The Golden Bough. A Study in Magic and Religion*, London: Macmillan and Co. Limited, 1922 (Abridged edition 1929). One of his key points is that in truly primitive societies there is a simple use of magic. It is assumed that if the magician or intermediary does something, something else will inevitably follow. Frazer (1929, p.12) shows that this approach can be reduced to (mis-) applications of associative thought, which he terms sympathetic magic (based on a law of sympathy) which he divides into Homeopathic Magic (Law of Similarity) and Contagious Magic (Law of Contact). At an earliest stage the objects of nature are themselves inhabited with the power. At a second stage these powers become associated with spirits, which inhabit the objects. Hence it is no longer the tree itself but the spirit of the tree which needs supplication. In a later stage it is assumed that these spirit powers can be influenced. It is at this stage where magic evolves into religion. While all this is of great importance in general, our particular story is concerned about the later stages in human expression where art becomes both a means of praising these external powers but also a way of gaining distance from them.

²¹ Cf. Franz Boas, *Primitive Art*, New York: Dover Publications, 1955. On the problem of primitive mentality see: Ernst E. Baesch, *Das Magische und das Schöne. Zur Symbolik von Objekten und Handlungen*, Stuttgart: Frommann-Holzboog, 1983.

²² Sir E. H. Gombrich, *The Sense of Order*, London: Phaidon, 1979.

²³ Cf. the Celtic tradition which also devotes great attention to ornament: G. Bain, *Celtic Art. The Methods of Construction*, London: Constable, 1977.

²⁴ Cf. C. Van der Sleyen, *Das alte Ägypten*, Frankfurt: Verlag Ullstein, 1975, pl. 46, (Propyläen Kunstgeschichte, Bd. 15).

²⁵ Sir E. H. Gombrich, *Art and Illusion*, Princeton: Princeton University Press, 1960, p.129.

²⁶ *Ibid.*, p. 131.

²⁷ Erich Auerbach, *Mimesis. The Representation of Reality in Western Literature*, Princeton: Princeton University Press, 1953. Originally written in German in Istanbul between May 1942 and April 1945 and first published in Bern by A. Francke Ltd. and Co., 1946.

²⁸ Cf. Heinrich Schäfer, *Principles of Egyptian Art*, tr. John Baines, Oxford: Clarendon Press, 1974.

²⁹ Pliny, *Natural History*, trans. H. Rackham, Cambridge, Mass: Harvard University Press, vol. IX, 1968, pp. 306-311 (XXXV.65-66).

³⁰ *Ibid.*, vol. IX, 1968, pp. 176-177 (XXIV,XIX.65):

vulgoque dicebat ab illis factos quales essent homines, a se quales viderentur esse.

³¹ This occurs in the context of Plato's discussion of appearance (*phantastike*) in the *Sophist*. Plato had noted that whereas sculptors maintained the true proportions of objects, painters did not, and had described the principle of optical adjustments methods (235e-236a):

objects which are seen at a certain elevation will appear too small and those which are positioned lower will appear too large, the ones being viewed from nearby, the others from afar. That is why workers these days abandon the true and give to their figures not the real measure of the model but that which should produce to the eye the impression of beauty of those figures.

See: Plato, "The Sophist," 236 a-c in *The Collected Dialogues of Plato* ed. Edith Hamilton and Huntington Cairns, Princeton: Princeton University Press 1961; p. 978-979 (Bollingen Series LXXI).

³² See the author's *Sources of Perspective*, chapter 5, unpublished manuscript (web version at www.sumscorp.com under perspective.

³³ One of the fundamental contributions of Sir Ernst Gombrich has been to demonstrate that psychological projections continue to imbue art. See: *Art and Illusion*. Princeton: Princeton University Press, 1960.

³⁴ Vitruvius, in the introduction to book seven of his *De architectura* reports that Agatharcus, a contemporary of Aeschylus painted a scene and left a commentary about it:

This led Democritus and Anaxagoras to write on the same subject, showing how, given a centre in a definite place, the lines should naturally correspond with due regard to the point of sight and the divergence of the visual rays, so that by this deception a faithful representation of the appearance of buildings might be given in painted scenery, and so that, though all is drawn on a vertical flat facade, some parts may seem to be withdrawing into the background, and others to be standing out in front.

See: Vitruvius, *The Ten Books on Architecture*, tr. Morris Hicky Morgan, New York: Dover, 1960, p. 198. For the original Latin see, Vitruvii *De architectura libri decem*, ed. Dr. C. Fensterbusch, Darmstadt: Wissenschaftliche Buchgesellschaft, 1976, p. 308.

³⁵ An image in the mind which is visual cannot be recorded or measured. It needs a verbal description. Hence, although visual in the mind, it nonetheless needs a verbal filter before it can be communicated.

³⁶ Vasari, as in I.2, note 1, vol.I, p.209.

³⁷ Auerbach, as in note 27 above.

³⁸ Cf. Sir E. H. Gombrich, "Illusion and art," in: *Illusion in Nature and Art*, ed. R.L. Gregory and E.H. Gombrich, London; Duckworth, 1973, pp. 193-243, particularly pp. 230-231.

³⁹ Michael Kubovy, *The Psychology of Perspective and Renaissance Art*, Cambridge: Cambridge University Press, 1986, pp.52-64.

⁴⁰ For an analysis see Marisa Dalai Emiliani, "Il ciclo del Foppa nella cappella Portinari."

⁴¹ Alessandro Parronchi, *Studi su la dolce prospettiva*, as in I.2, note 6, pp.340-348.

⁴² Alessandro Parronchi, *Masaccio*, Florence: Sadea Sansoni, 1966. His reconstruction is reproduced in: *L'opera completa di Masaccio*, ed. Paolo Volponi, Luciano Berti, Milano: Rizzoli, 1968, p.96.

⁴³ Cf. Jean Seznec, *The Survival of the Pagan Gods*, trans. Barbara F. Sessions, New York: Harper and Row, 1953.

⁴⁴ For an analysis of the contents of these paintings, cf. S. J. Freedberg, *Painting in the High Renaissance in Rome and Florence*, Cambridge, Mass.: Harvard University Press, 1961, 2 vol.

⁴⁵ Leonardo da Vinci, A 96r (BN 2038 16r, TPL 119, 1492):

Ti rispondo che tu debbi porre il primo piano col punto al'altezza de l'occhio de riguardatori d'essa storia et in sul detto piano figura la prima storia grande e poi diminuendo di mano in mano le figure e casamenti in su diverse colli e pianure farai tutto il fornimento d'essa storia.

For another discussion of this passage see: Sir E. H. Gombrich, *Means and Ends*, as in I.1, note 30, p. 10.

⁴⁶ Gotthold Ephraim Lessing, *Läokoon, oder über die Grenzen der Malerei und Poesie*, Stuttgart: Reclam, 1964, (271/71 a/b), p. 114:

Ich schliesse so. Wenn es wahr ist, dass die Malerei zu ihren Nachahmungen ganz andere Mittel, oder Zeichen gebraucht, als die Poesie; jene nämlich Figuren und Farben in dem Raume, diese aber artikulierte Töne in der Zeit; wenn unstreitig die Zeichen ein bequemes Verhältnis zu dem Bezeichneten haben müssen: so können nebeneinander geordnete Zeichen auch nur Gegenstände, die nebeneinander, oder deren Teile nebeneinander existieren, aufeinanderfolgende Zeichen aber auch nur Gegenstände ausdrücken, die aufeinander, oder deren Teile aufeinander folgen.

⁴⁷ *Ibid.*, p. 114:

Gegenstände, die nebeneinander oder deren Teile nebeneinander existieren, heissen Körper. Folglich sind Körper mit ihren sichtbaren Eigenschaften die eigentlichen Gegenstände der Malerei.

Gegenstände, die aufeinander, oder deren Teile aufeinander folgen, heissen überhaupt Handlungen. Folglich sind Handlungen der eigentliche Gegenstand der Poesie.

⁴⁸ *Ibid.*, p. 127.

Denn wer sieht nicht, dass dem Dichter hier mehr an der Auseinandersetzung der Teile, als an dem Ganzen gelegen gewesen? Er will uns die Kennzeichen eines schönen Füllens, einer tüchtigen Kuh zuzählen, um uns in den Stand zu setzen,

nachdem wir deren mehr oder weniger antreffen, von der Gute der einen oder des andern urteilen zu können; ob sich aber alle diese Kennzeichen in ein lebhaftes Bild leicht zusammenfassen lassen, oder nicht, das könnte ihm sehr gleichgültig sein.

Ausser diesem Gebräuche sind die ausführlichen Gemälde körperlicher Gegenstände, ohne den oben erwähnten Homerischen Kunstgriff, das Koexistierende derselben in ein wirkliches Sukzessives zu verwandeln, jederzeit von den feinsten Richtern für ein frostiges Spielwerk erkannt worden, zu welchem wenig oder gar kein Genie gehöret. Wenn der poetische Stümper, sagt Horaz, nicht weiter kann, so fangt er an, einen Hain, einen Altar, einen durch anmutige Fluren sich schlängelnden Bach, einen rauschenden Strom, einen Regenbogen zu malen.

⁴⁹ Ibid., p.129:

Es bleibt dabei: die Zeitfolge ist das Gebiete des Dichters, so wie der Raum das Gebiete des Malers.

Zwei notwendig entfernte Zeitpunkte in ein und ebendasselbe Gemälde bringen, so wie Fr. Mazzuoli den Raub der sabinischen Jungfrauen, und derselben Aussohnung ihrer Ehemänner mit ihren Anverwandten; oder wie Tizian die ganze Geschichte des verlorren Sohnes, sein liederliches Leben und sein Elend und seine Reue: heisst ein Eingriff des Malers in das Gebiete des Dichters, den der gute Geschmack nie billigen wird.

⁵⁰ Leonardo da Vinci, *Codex Urbinas 1270*, fol. 123r (TPL 374): Delle otto [sic] operazioni del huomo.

Fermezza, movimento, cuorso, ritto, apoggiato, a sedere, chinato, ginocchioni, giacente, sospeso, portare, esser portato, spingere, tirare, batere, esser batuto, agravare e allegierire.

⁵¹ Andre Chastel, *I centri del rinascimento Arte italiano 1460-1500*, Milan: Rizzoli, 1965, p.123.

⁵² Henry Heydenryk, *The Art and History of Frames*, London: Nicholas Vane, 1964, p.13.

⁵³ Ibid., p.18.

⁵⁴ For a good introduction to this theme see: Eve Borsook, *Mural Painters of Tuscany*, London: Phaidon, 1960. Recently these cycles have been wonderfully reproduced in a two volume work by Steffi Roettgen, *Italian Frescoes*, New York: Abbeville Press Publishers, 1996-1997.

⁵⁵ Cf. Augustine, *The City of God*, Harmondsworth: Penguin, 1972, pp. 168-169 (Bk. IV.27).

⁵⁶ On the special role of the Bible in western culture see: Northrop Frye, *The Great Code. The Bible and Literature*, Toronto: Academic Press, 1982.

⁵⁷ Cf. Aristotle, *De poetica*, as in note 1, 1458a 20 ff.:

On the other hand the Diction becomes distinguished and non-prosaic by the use of unfamiliar terms, i.e., strange words, metaphors, lengthened forms and everything that deviates from the ordinary modes of speech."

Accordingly in the *Rhetorica*, 1404, 33ff., Aristotle mentions that "two classes of terms, the proper or regular and the metaphorical - these and no others - are used by everybody in conversation." For a perceptive study of the historical dimensions of these problems, why metaphor was a frill in Aristotle and later became significant see: Wilhelm Köller, *Semiotik und Metapher. Untersuchungen zur grammatischen Struktur and Kommunikativen Funktion von Metaphera*. Stuttgart: J.B. Metzler, 1975. (Studien zur allgemeinen und vergleichenden Literaturwissenschaft, Band 10).

⁵⁸ *The Comedy of Dante Alighieri the Florentine. Cantica II. Purgatory*, trans. Dorothy L. Sayers, Harmondsworth: Penguin Books, 1955, p.144 (Canto X. 37-45).

I am grateful to Professor Eva Engel Holland for drawing my attention to this passage.

⁵⁹ Ibid., p. 145 (Canto X.62).

⁶⁰ Ibid., (Canto X.73).

⁶¹ Ibid., (Canto X.75).

⁶² Cf. Dennis Green, 1982.

⁶³ Caricature is strictly speaking a subset of this category. I am not aware of a proper term for the category as a whole.

⁶⁴ For a brief introduction to these problems see *The Comedy of Dante Alighieri...Cantica III. Paradise*, trans. Dorothy L. Sayers and Barbara Reynolds, Harmondsworth: Penguin, 1962, pp. 44-49. Cf. Northrop Frye, *Anatomy of Criticism*, Princeton: Princeton University Press, 1957.

⁶⁵ Metaphor has, in the past decade, become one of the most explosive topics of study particularly among psychologists and semioticians. See, for instance: G. Lackoff and M. Johnson, *Metaphors We Live By*, Chicago: University of Chicago Press, 1980 and Marcel Danesi, ed., *Metaphor, Communication and Cognition*, Toronto: Humanities Publishing Services, 1987-1988 (Monograph series of the Toronto Semiotic Circle, No. 2).

A classic analysis of the problem remains Karl Bühler's chapter on "Die sprachliche Metapher" in his *Sprachtheorie. Die Darstellungsfunktion der Sprache*, Stuttgart: Gustav Fischer Verlags, 1965, pp. 342-356. For an idea of the range of disciplines now involved in these discussions see: *Metaphor and Thought*, ed. Andrew Ortony, Cambridge: Cambridge University Press, 1979. Philosophers have shown increasing interest in the problem as, for instance, Max Black, *Models and Metaphors. Studies in Language and Philosophy*, Ithaca: Cornell University Press, 1962.

⁶⁶ On this difficult problem see an important study by Brian Stock, *The Implications of Literacy. Written Language and Models of Interpretation in the Eleventh and Twelfth centuries*, Princeton: Princeton University Press, 1983. On the history of printing see: Elizabeth L. Eisenstein, *The Printing Press as an Agent of Change*, Cambridge: Cambridge University Press, 1979.

⁶⁷ Modern art has many examples of paintings on the walls of rooms in paintings, which function as background statements. With respect to Dali's case in particular see his: *Le mythe tragique de l'Angelus de Millet. Interprétation paranoïaque-critique*, Paris: Jean Jacques Pauvert, 1963.

⁶⁸ Detailed study of this complex topic has yet to occur. For two pioneering explorations of the problem see: Wolfgang Kemp, *Foto-Essays zur Geschichte und Theorie der Fotografie*, Munich: Schirmer Mosel, 1978, particularly pp. 51-101, and Kirk Varnedoe, "The artifice of candour, photography, impressionism and photography reconsidered," *Art in America*, New York, vol. 66, January 1980, pp.66-78.

⁶⁹ Cf. Sir E. H. Gombrich, "Botticelli's mythologies" in his: *Symbolic Images*, London: Phaidon, pp.31-78.

⁷⁰ Salvatore Settis, *La Tempesta interpretata. Giorgione, i commitenti, il soggetto*, Turin: G. Einaudi, 1978.

⁷¹ Erwin Panofsky, *Studies in Iconology. Humanistic Themes in the Art of the Renaissance*, New York: Oxford University Press, 1939, pp.86-91. (Mary Flexner Lectures, 1937).

⁷² For examples of these artists see: H. H. Arnason, *A History of Modern Art*, London: Thames and Hudson, 1977 etc., pp. 422-423, 427-431: (re: precisionists); 613-645 (re: pop art); 699-702 (re: new and photo realism). The references to Arnason are intended to provide readers with handy examples of three movements, and introduce them to the subject. No attempt is made here to give a serious bibliography.

⁷³ J. Baltrusaitis, as in I.1, note 10.

⁷⁴ Cf. Arnason, as in note 57, pp. 73-74.

⁷⁵ Albert Gleizes, *Du cubisme et des moyens de le comprendre*, Paris: Editions 'La Cible', 1921, p.47:

Au début, la charpente créée sur les principes perspectifs, était robuste, mais elle fut renversée par les affolés de réalisme et ce fut l'impressionnisme, qui se lanca éperduement sur les inconsistances atmosphériques.

⁷⁶ *Ibid.*, pp.26-27:

Si l'artiste, dont la spécialité est de peindre des natures mortes académiquement, renonçait tout à coup à ses sujets favoris et se passionnait pour des sujets composés de briques, de cylindres et de planchettes, il les peindrait avec la perspective optique et l'éclairage conventionnel....

Beaucoup de tableaux cubistes ne sont que le produit de cette substitution.

⁷⁷ *Ibid.*, pp.18-19:

Prétendre l'investir d'une troisième dimension, c'est vouloir la dénaturer dans son essence même:

Le résultat obtenu ne devient que l'imitation trompe-l'oeil de notre réalité, matérielle à trois dimensions, par la supercherie des perspectives linéaires et celle des conventions d'éclairage.

For a more vehement theoretical rejection of perspective see: *Oeuvres complètes de Guillaume Apollinaire*, ed. Michel Décaudin, Paris: André, Balland et Jacques Lecat, 1963, particularly pp.20-21, 24-25,42,47, 274-275,286-287, 432-433.

⁷⁸ *Ibid.*, pp.23:

la peinture n'est donc pas une imitation d'objets. La réalité du monde extérieur lui sert de départ, mais elle la dépouille de cette réalité pour toucher l'esprit.

⁷⁹ Cf. Arnason, as in note 57, pp.221-240, 323-330, 591-598.

⁸⁰ *Ibid.*, pp.375-76.

⁸¹ *Ibid.*, pp.370-371, 389-391.

⁸² One of the great collections of these books is to be found at the Herzog August Bibliothek at Wolfenbüttel. Professor Harriett Watts is presently engaged in a study thereof.

⁸³ Cf. Abraham Horodisch, *Picasso als Buchkünstler*, Frankfurt: Gesellschaft der Bibliophilen, 1957.

⁸⁴ Cf. Arnason, as in note 57, pp.507-508, 521-523, 652-653, 678-679.

⁸⁵ *Ibid.*, pp.78-80.

⁸⁶ *Ibid.*, p.290.

⁸⁷ *Ibid.*, pp.292-306.

⁸⁸ *Ibid.*, pp.219, 307-316, 395-396.

⁸⁹ *Ibid.*, pp.348-409.

⁹⁰ *Ibid.*, pp.658 ff., 703-706.

⁹¹ Cf. William Kurelek, *William Kurelek's Vision of Canada*, Winnipeg: Hurtig, 1980.

⁹² Arnason, as in note 57, p.567.

⁹³ Cf. Christopher Grey, "Cézanne's use of perspective," *College Art Journal*, New York, vol.19, no. 1, Fall 1959, pp.54-64.

⁹⁴ . See John Rewald, "Van Gogh vs. nature: did van Gogh of the camera lie?", *Art News*, New York, vol.41, 1942, pp.8-11. Cf. Patrick Heelan, *Space-Perception and the Philosophy of Science*, Berkeley: University of California Press, 1983, pp.114-128.

⁹⁵ Cf. Hermann von Helmholtz, *Helmholtz's Treatise on Physiological Optics*, trans. James P.C. Southall, New York: Dover Publications, 1962, vol.3, p.181; F. Hillebrand, "Theorie der scheinbaren Grösse bei binokularen Sehen," *Abhandlungen der Akademie, der Wissenschaften zu Wien, Mathematisch-naturwissenschaftliche Klasse*, Vienna, Bd. 72, 1902; A. E. Ames, and C.A. Proctor, "Dioptrics of the Eye," *Journal of the Optical Society of America*, Rochester, Vol.5, 1921, pp.22-84. R. K. Luneburg, *Mathematical Analysis of Binocular Vision*, Hanover: Dartmouth Eye Institute, 1947.

⁹⁶ Guido Hauck, *Die subjektive Perspektive und die horizontalen Curvaturen des dorischen Styls*, Stuttgart: Conrad Wittwer, 1879.

⁹⁷ Erwin Panofsky, "Die Perspektive als symbolische Form," as in I.2, note 27.

⁹⁸ Cf. Robert Hansen, "This curving world: hyperbolic linear perspective," *Journal of Aesthetics and Art Criticism*, Baltimore, vol.32, no. 2, winter 1973, pp.148-161. Cf. Hansen's introductory commentary to his translation of Albert Flocon and André Barre, *Curvilinear Space. From Visual Space to Constructed Image*, Berkeley: University of California Press, 1987.

⁹⁹ M. H. Pirenne, "The scientific basis of Leonardo da Vinci's theory of perspective," *British Journal for the Philosophy of Science*, London, vol.3, 1952, pp.169-185.

¹⁰⁰ Dick Termes, *Spherical Thinking*, Spearfish, 1982.

¹⁰¹ Philippe Comar et Noël Blotti, *Stenopé. La représentation de l'espace*, Paris: Cité des sciences et de l'industrie (1987).

¹⁰² In: Marcia Clark, ed., *The World is Round. Contemporary Panoramas*, New York: The Hudson River Museum, 1987, p.31.

¹⁰³ *Ibid.*, p.43.

¹⁰⁴ *Ibid.*, pp.43, 51, 35.

¹⁰⁵ *Ibid.*, pp.59, 27, 45.

¹⁰⁶ *Ibid.*, p.8.

¹⁰⁷ *Ibid.*, p.35.

¹⁰⁸ Fritz Novotny, *Cézanne und das Ende der wissenschaftliche Perspektive*, Vienna: Schroll, 1938.

¹⁰⁹ Cf. Suzi Gablik, *Progress in Art*, London: Thames and Hudson, 1976.

¹¹⁰ Cf. Sidney J. Blatt, in collaboration with Ethel Blatt, *Continuity and Change in Art: the Development of Modes of Representation*, Hillsdale: Lawrence Erlbaum, 1984.

While disagreeing strongly with my colleagues and friends, I find their book very stimulating. They document why the conceptual approach has gained such a fascination among psychologists. I, personally, believe that perception remains both interesting and important. For an analysis of problems with their approach see the author's *Literature of Perspective*, Chapter 1.

Blatt is tackling the difficult question of progress in art, which has been treated at a popular level in S. Gablik, *Progress in Art*, London: Thames and Hudson, 1976. On this subject see A.L. Fox, General Pitt Rivers, "The Evolution of Culture". A Lecture delivered at the Royal Institution of Great Britain on Friday, May 28, 1875 and published in: *Proceedings of the Royal Institution*, London, vol. VII, pp. 496-520, pl. i-iv. Also: O. Montelius, *Die älteren Kulturperiode*, Stockholm: Selbstverlag der Verfasser, 1903-1923, 2 volumes. See also M. W. Thompson, *General Pitt Rivers. Evolution and Archaeology in the Nineteenth Century*, Bradford on Avon: Moonraker Press, 1977.

For a history of theories of progress see: T. Munro, *Evolution in the Arts and other Theories of Culture History*, New York: Harry Abrams, 1963 (reviewed by E. H. Gombrich in the *British Journal for Aesthetics*, vol. 3, no. 3, July 1964, pp. 263-270), and E. H. Gombrich, *The Ideas of Progress and their Impact on Art*, New York: Cooper Union of Art and Architecture, 1971. This latter work is more readily available in German translation: *Kunst und Fortschritt, Wirkung und Wandlung einer Idee*, Köln: Dumont, 1978.

¹¹¹ Erwin Panofsky, "Die Perspektive als symbolische Form", Vorträge der bibliothek Warburg 1924-1925, Leipzig, Berlin, 1927, pp. 258-330.. For a critique of these assumptions see the author's "Panofsky's Perspective: a Half Century Later," *La prospettiva rinascimentale*, ed. Marisa Dalai Emiliani, Florence: Centro Di, 1980, pp.565-584.

¹¹² For a discussion of Panofsky's context see the author's: Panofsky's perspective: a half century later" in: Marisa Dalai Emiliani, ed., *La prospettiva rinascimentale. Codificazioni e trasgressioni*, Florence: Centro Di, 1980, pp. 565-584.

¹¹³ H. Cohen, *Ästhetik des reinen Gefühls*, Berlin: P. Cassirer, 1912. Cf. his: *Kants Begründung der Ästhetik*, Berlin: F. Dümmler, 1889.

¹¹⁴ Sir E. H. Gombrich, *Aby Warburg. An Intellectual Biography*, London: Warburg Institute, 1970.

¹¹⁵ Sir E. H. Gombrich, *Norm and Form, Studies in the Art of the Renaissance I*, London: Phaidon, 1966; Sir E.H. Gombrich, *Symbolic Images, Studies in the Art of the Renaissance II*, London: Phaidon, 1972; Sir E.H. Gombrich, *The Heritage of Apelles. Studies in the Art of Renaissance III*, London: Phaidon, 1976.

¹¹⁶ Sir E. H. Gombrich, *The Sense of Order. A Study in the Psychology of Decorative art*. London: Phaidon, 1979, p.ix.

¹¹⁷ Ibid.

¹¹⁸ Sir E. H. Gombrich, *Art and illusion. A study in the psychology of pictorial Representation*, Princeton: Princeton University Press, 1960 (Bollingen series XXXV.5);

R.L. Gregory and E.H. Gombrich, ed., *Illusion in Nature and Art*, London: Duckworth, 1973; Sir E.H. Gombrich, *The Image and the Eye. Further Studies in the Psychology of Pictorial Representation*, Oxford: Phaidon, 1982.

¹¹⁹ Sir E. H. Gombrich, *The Sense of Order*, as in note 101, p.ix.

¹²⁰ Cf. Sir E. H. Gombrich, *Art and Illusion*, as in note 103, p.152. Cf. quote relating to our note 104.

¹²¹ Cf. Sir E. H. Gombrich, *The Ideas of Progress and their Impact on Art*, New York: Cooper Union School of Art and Architecture, 1971.

¹²² Ernst Cassirer, *Individuum und Cosmos in der Philosophie der Renaissance*, Leipzig: B.G. Teubner, 1927 (Studien der Bibliothek Warburg, X); Cf. Ernst Cassirer, *Individual and the Cosmos in Renaissance Philosophy*, trans. Mario Domandi, New York: Harper and Row, 1964, particularly pp.123-191.

¹²³ There are larger questions here. Joseph Campbell in *Oriental Mythology*, Harmondsworth: Penguin, 1962, begins with a fascinating contrast between Eastern and Western culture, suggesting that the separation of man from God and nature has been an aspect of western culture from the outset in a way that is not the case in the east. In other words, the subject-object distinction, although it came into focus during the Renaissance, had Biblical roots in the West.

¹²⁴ See: http://195.209.240.14/doc/ist/PR_english.html then National Identity Network. On the other hand Russia also has an Institute for Memory and Cultural Heritage.

¹²⁵ For an example of such courses see web of Culture.

See: <http://www.webofculture.com/corp/mission.html>.

¹²⁶ Chris Cox, "Meta Standards: tools for harmony within Cultural Diversity," *TKE '99. Terminology and Knowledge Engineering*, Vienna: TermNet, 1999, pp. 694-700.

¹²⁷ For an introduction to new theories of Leadership see a course by Raymond D. Aldag at University of Wisconsin.

See: <http://instruction.bus.wisc.edu/raldag/mhr702/syllabus.htm>. See also: H. M. Trice & J. Beyer, *The Cultures of Work Organizations*, New York: Prentice-Hall, 1993. Especially :Ch. 3: Cultural Forms.

¹²⁸ See, for instance, an article by Robert D. Russell, "The Role of Organizational Culture in Fostering Innovation in the Small Business: How Can the Entrepreneur create a Culture of Change?"

See: <http://www.lowe.org/data/htmldocs/2755.HTM>. cf. Howard W. Oden, *Managing Corporate Culture, Innovation, and Intrapreneurship*, Westport, Conn.:

Quorum Books. 1997. A number of recent books discuss corporate culture:

Terrence E. Deal, Allan A. Kennedy, *Corporate Cultures : The Rites and Rituals of Corporate Life*, Reading, MA: Perseus Press, 1984; John P. Kotter, James L. Heskett (Contributor), *Corporate Culture and Performance*, New York: Free Press (Simon & Schuster), 1992; Joanne Martin, *Cultures in Organizations: Three Perspectives*, New York: Oxford University Press, 1992; Edgar H. Schein, *Organizational Culture and Leadership*, San Francisco: Jossey Bass, 1997, (Jossey-Bass Business & Management Series); Robert Goffee, et al., *The Character of a Corporation : How Your Company's Culture Can Make or Break Your Business*, New York: Harper business, 1998. For a minimal history of corporate identity and design culture.

See: http://www.si.edu/ndm/exhib/mixingmessages/essay/id/i_a.L2.html.

¹²⁹ In Britain, for example, there are striking ways in which the National Grid for Learning is linked with a new University of/for Industry and one senses a greater concern with preparing students to be docile future employees (yes persons par excellence) than in developing the critical skills that have traditionally been associated with the best of higher education. This trend is not limited to Britain. In the U.S. there is the Chalkboard: A Classroom Corporate Connection at <http://thechalkboard.com/>. For a graphic example of potential links between corporate culture and education see Mentoring Services Inc.

See: <http://www.galaxymall.com/business/mentoring/>.

It is striking to note the parallels between titles in education and those in business. Here the ideas of Peter Senge qua the Learning Organization have undoubtedly played an important role.

Cf. <http://commhum.mccneb.edu/PHILOS/senge.htm>. Note that the emphasis is not on the individuals within an organization learning, but rather on the organization itself learning as if the individuals were no longer central.

The following excerpts from a reading list for teachers serve as further examples of this curious interplay between business and learning:

Gareth Morgan, *Images of Organization: The Executive Edition*, Berrett-Koehler Publishers, 1998;

Peter Raggatt, Richard Edwards, Nick Small, (editors), *The Learning Society: Challenges and Trends*, (Open University Set Book, 1996)

Joel F. Handler, *Down From Bureaucracy: The Ambiguity of Privatization and Empowerment*, Princeton: Princeton University Press, 1996.

Richard Dawkins, *The Selfish Gene*, Oxford: Oxford University Press, 1990.

Thomas J. Sergiovanni, *Leadership for the School House: How Is It Different? : Why Is It Important?*, New York: Jossey Bass, 1995, (*Jossey-Bass Education Series*);

Michael Fullan/Suzanne Stiegelbauer, *The Meaning of Educational Change*; Michael Fullan, *The New Meaning of Educational Change*, New York: Teachers College Press, 1991. Michael Fullan, Andrew Hargreaves (editor), *Teacher Development and Educational Change*, London: Falmer Press, 1992; *Change Forces: Probing the Depths of Educational Reform*, London: Falmer Press, 1993 (*School Development and the Management of Change*, 10)

Edgar Schein, *Organization, Culture, and Leadership*, New York: Jossey Bass, 1997, (*Jossey-Bass Business & Management Series*, 1997).

Thomas H. Davenport, *Information Ecology: Mastering the Information and Knowledge Environment*, New York: Oxford University Press, 1997.

¹³⁰ For a subtle example see United Innovations.

See: <http://www.mmaweb.com/ui/about.html>.

For examples of corporate culture as told by the corporations themselves

See: <http://www.prcentral.com/bokcorpcult.htm>. See also an insightful essay by Charles S. Sanford, Jr., "Managing the Transformation of a Corporate Culture: Risks and Rewards".

See; <http://www.libs.uga.edu/hargrett/collects/sanford/leadership.html>. For a study of patterns of Corporate Philanthropy in the United States.

See: <http://www.capitalresearch.org/patterns/PatternsXI.htm>.

¹³¹ For an example which claims the need for respect for cultural diversity

See: <http://www.johnmole.com/what.htm>. For a seemingly neutral definition of corporate culture see that of J D Edwards.

See: <http://www.jdedwards.com/Company/culture.pdf> :

"Our corporate culture consists of two elements, the Corporate Ideals and values to which we strive, and the peaceful Work Environment we maintain to promote job satisfaction, productivity and quality consciousness."

Quite a different definition is offered by Blickmann and Collegen.

See: <http://www.bickmann.de/bickmann/> who note that Corporate Identity & Corporate Culture entail the following:

Vision Development	Visionsentwicklung
Change Programmes	Change-Programme
Leadership Principles	Führungsgrundsätze
Leitmotifs/Philosophy	Leitbilder/Philosophie
Corporate Design	Corporate Design
M & A Guidance	M & A Begleitung
Personnell Questionning	Mitarbeiterbefragungen
Going Public	Going Public
Leadership Development	Führungskräfteentwicklung
Internationalisation	Internationalisierung
Virtualisation and Partial Virtualisation	Virtualisierung und Teil-Virtualisierung.

¹³² There are now Corporate Transformation Models and Tools.

See: <http://www.corptools.com/text/ctmt.htm>) which entail Corporate Culture Assessment:

- identifies the top ten personal, organizational and ideal organizational values by group and department, including demographic distinctions.
- assesses the degree of alignment between personal, organizational and ideal organizational values.
- indicates the degree of alignment between the organization's actual values and its espoused values.
- identifies the behavioral changes that are necessary to build human capacity, employee fulfillment and a long-lasting successful organizational culture.
- identifies the distribution of personal values, organizational values and ideal organizational values according to the seven levels of organizational consciousness.
- indicates the degree to which the organization's culture is focused on self-interest, self-renewal (transformation) and the common good.

For an example of training concerning corporate culture.

See: <http://iplex.com/planm/partd/culturelist>.

For a quite different approach which links corporate culture with civil responsibility

See: <http://cbpa.louisville.edu/bruce/imba/reflection/culture.htm>. See also:

Price Pritchett, *Mindshift : the employee handbook for understanding the changing world of work*, Dallas, TX : Pritchett & Associates, Inc., c1996.

¹³³ Key to these developments is the so called Multilateral Agreement on Investment (MAI) the problems of which are outlined.

See: <http://mai.flora.org/>.

¹³⁴ One of the important statements in this area is David C. Korten, *When Corporations Rule the World*, West Hartford, San Francisco: Kumarian Press, Berrett-Koehler, 1995. Cf. *Invisible Crises. What Conglomerate Control of Media Means for America and the World*, ed. George Gerbner, Hamid Mowlana, Boulder: Westview Press, 1996. These are extreme and somewhat one-sided views. For a criticism thereof and a discussion of larger issues concerning globalisation of the economy

See: http://baobabcomputing.com/corporatepower/Critiques_of_the_Global_Economy/.

For a more balanced view of some of the problems see also: Geoffrey Reeves, *Communications and the Third World*, London, New York: Routledge, 1993; Ziauddin Sardar, Jerome K. Ravetz, *Cyberfutures. Culture and Politics on the Information Superhighway*, London: Pluto Press, 1996.

For other dangers to culture through corporations see: Herbert I. Schiller, *Culture Inc. : The Corporate Takeover of Public Expression*, New York: Oxford university Press, 1991. On questions of cultural imperialism see: Nancy Snow, *Propaganda Inc.: Selling America's Culture to the World*, Seven Stories Press, 1998.

¹³⁵ Inherent here, of course, are problems that affect all aspects of our society. Part of the rhetoric of these multi-nationals is that the markets adjust themselves, that regulatory bodies are now obsolete and indeed, that many of the traditional functions of government are also obsolete. In this view the future of government lies in privatization of assets.

It is important to recognize that this rhetoric is not exactly new. It was very popular in Britain in the late sixties and seventies and had some unexpected consequences. As Professor Derek Law, noted recently at a summer course on digital culture (at MMI) in Maastricht, at the time of the war with the Falkland Islands, authorities found that they were without maps of their former territory. All the maps in the appropriate government agency had been sold off. The problem was resolved by consulting the maps at the Royal Geographical Society. This predicament led the government to reconsider how much materials gathered with taxpayers' money should reasonably be sold off. It is striking to see that the potential lessons to be learned from such experiences are not preventing various countries from pursuing the chimera of making money by privatising that which has been acquired by the public for the public good.

¹³⁶ Benedetto Croce, *Aesthetic, as Science of Expression and General Linguistic*, transl. D. Ainslie, Boston: Non Pareil Books, (1909 original), 1978, p. 136.

¹³⁷ Daniel C. Dennett, *The Evolution of Culture*, The Charles Simonyi Lecture, Oxford University, 17 February 1999.

See: http://www.edge.org/3rd_culture/dennett/dennett_p1.html. This general notion builds on the approach of Richard Dawkins. The epidemiological approach has been explored by FCT Moore, "The Contagion of Ideas: on Dan Sperber's epidemiological model of culture," Department of Philosophy: The University of Hong Kong, (Seminar paper : 9 October 1997. One of a series of meetings in preparation for Dan Sperber's visit to the University of Hong Kong in November/December as the Kenneth Robinson Fellow).

See: <http://www.hku.hk/philodep/tm/sperber.htm>.

¹³⁸ Ibid., p. 2 of 4.

¹³⁹ Ibid., p. 4 of 4.

¹⁴⁰ Elliott Sober, David Sloan Wilson, *Unto Others: The Evolution and Psychology of Unselfish Behavior*, Cambridge, Mass: Harvard University Press, 1998.

¹⁴¹ Petra Janboers, "De mens volgens psycholoog Susan Blackmore: een verzameling genen en memen", *De Telegraaf*, 29 May 1999, p.TA5.

Cf. www.memes.org.uk.

¹⁴² See: http://www.edge.org/3rd_culture/3rd_continue.html

¹⁴³ For an insightful assessment of science see Gustav V. R. Born, "The freedoms and limits of science. Fringe thoughts of an experimental pharmacologist," *Alexander von Humboldt Stiftung Mitteilungen, AvH Magazin*, Bonn, Nr. 72, December 1998, pp. 3-14

¹⁴⁴ If the reader feels that the author overreacting on this point they may wish to reflect upon the closing statement of this group's "manifesto" found at the website in the previous note:

Throughout history, intellectual life has been marked by the fact that only a small number of people have done the serious thinking for everybody else. What we are witnessing is a passing of the torch from one group of thinkers, the traditional literary intellectuals, to a new group, the intellectuals of the emerging third culture.

In this author's view the above passage has a little disguised ultra-elite agenda which is not about opening up and making accessible the traditions of different cultures which is our topic.

¹⁴⁵ Noemi Smolik, "Ohrfeige dem öffentlichen Geschmack. Künstler der russischen Avantgarde und die Wissenschaft," *2 Internationaler KünstlerSymposium*, Ulm, 1997, pp.3-8.

¹⁴⁶ Jacobson left Russia and had as his student Claude Levy Strauss.

¹⁴⁷ Smolik notes that Alexandre Kojve a nephew of Kandinsky, who was influenced by Solovjev, and studied with Karl Jaspers went on to Paris to lecture at the Ecole des Hautes Etudes from 1933 to 1939 where he coined the phrase *post histoire* which was taken up in the seventies as the *postmoderne*. On the question of postmodern culture

See: <http://jefferson.village.virginia.edu/pmc/contents.all.html>.

¹⁴⁸ For a survey of the dangers of Internet see: Neil Barrett, *The State of the Cybernation. Cultural, Political and Economic Implications of the Internet*, London: Kogan Page, 1996.

¹⁴⁹ See: <http://www.museums.reading.ac.uk/vlmp/>. A fuller list of museums is available in *Museums of the World, Museen der Welt*, Munich: Verlag Dokumentation, 1973, 1997 etc. Originally a list of 17,000 Museums in 148 countries. Now 27,000 museums from 190 countries.

See: <http://www.saur.de/museum.htm>.

¹⁵⁰ See: <http://about.com>

¹⁵¹ See: http://home.about.com/culture/cultureamer/index.htm?PM=76_803_T

¹⁵² See: http://home.about.com/culture/cultureeurope/index.htm?PM=76_805_T

¹⁵³ See: http://home.about.com/culture/cultureasia/index.htm?PM=76_804_T

¹⁵⁴ See: <http://africancultures.about.com/msub22.htm?pid=4579&cob=home>. Admittedly, the Africa site has a number of other headings: African Studies, Anthropology & Archeology, Architecture, Art, Cities, Costume, Customs, Dance, Drama, Film, Food, Governments, History, Language, Literature, Maps, Museums and Galleries, Music,

News, Organizations, Peoples, Religions, Slave Trade, Societies, and Women. But even these scarcely reflect the complexity of the African continent.

¹⁵⁵ See: <http://www.icom.org/vlmp/world.html>

¹⁵⁶ I.e. astrology, conspiracies and extremism, new age, paranormal phenomena, UFOs/aliens, urban legends and folklore.

¹⁵⁷ College Life, Deafness/Hard of Hearing, Gay Life, Lesbian Life.

See: http://home.about.com/culture/groups/index.htm?PM=76_807_T.

¹⁵⁸ See: http://www.gvu.gatech.edu/user_surveys/survey-1998-10/graphs/general/q11.htm

¹⁵⁹ *How New Media are Transforming Society*, ed. Bertrand Schneider (Resume of the main points discussed at the end of the conference at the Smithsonian Institution Washington, 24-26 October 1997).

See: <http://www.clubofrome.org>:

At the most practical level, on the use of language, there is no doubt that an inability to use English restricts full access to the Worldwide Web. In a survey conducted over a year ago, the Internet Society showed that English accounted for 82 per cent of the Websites worldwide. German was second with an enormous 4 per cent; followed by Japanese at 1.6 per cent, French at 1.5 per cent, and Spanish at 1.1 per cent.

¹⁶⁰ See: <http://www.euromktg.com/globstats/>

¹⁶¹ See: http://www.emarketer.com/estats/071299_north.html. In the interests of elegance I have removed this and the following reference from the original quote and relegated them to the footnotes.

¹⁶² See: http://www.emarketer.com/estats/071999_home.html

¹⁶³ Jeffrey R. Harrow, *The Rapidly Changing Face of Computing*, Aug. 2, 1999.

See: <http://www.compaq.com/rcfoc>

¹⁶⁴ Cf. George Kubler, *The Shape of Time. Remarks on the History of Things*, New Haven: Yale University Press, 1962

¹⁶⁵ To this end the Maastricht McLuhan Institute has submitted a proposal for project in their a 5th Framework Programme on Virtual Reference Rooms (VERO).

In the longer term we need new ways to visualise the kind of organisation of knowledge reflected in the library of the Warburg Institute in London (figure 11).

Fourth Floor	Practice	History
Third Floor	Theory	Philosophy, Science
Second Floor	Visual Expression	Art
First Floor	Verbal Expression	Literature
Ground Floor	Reference	Dictionaries, Catalogues

Figure 15. Scheme of the organisation of books at the Warburg Institute in London.

¹⁶⁶ Cf. the author's: "A Databank on Perspective: The Concept of Knowledge Packages", *Metodologia della ricerca: orientamenti attuali. Congresso internazionale in onore di Eugenio Battisti*, Milan, 1991, *Arte Lombarda*, Milan, 1994, n. 3-4, parte seconda, pp. 166-170.

¹⁶⁷ Reconstructions in the plural because there will almost invariably be different and even conflicting interpretations concerning this.

¹⁶⁸ *Medieval Metropolis. Metropoli medievali. Proceedings of the Congress of Atlas Working Group, International Commission for the History of Towns*, ed. Francesca Bocchi, Bologna: Grafis, 1998. (Attraverso le città italiane, 6).

¹⁶⁹ Important in this context is the new JINI/HAVI (Home Audio-Visual Information environment) consortium of SUN/Philips, Sony, Hitachi and other consumer electronics giants. In 2002 with the advent of UMTS (Universal Multimedia Telecommunications Services) such wireless technologies will be available anywhere, anytime through satellite up/down-links.

¹⁷⁰ It is intended that his topic, which was touched upon the author's recent opening keynote at the terminology and Knowledge Engineering Conference (TKE99, Innsbruck), will be the subject of a paper for WWW9 in 2000 (Amsterdam).

¹⁷¹ The whole question of the interpretation of art and culture is an enormously complex field, the details of which are beyond the scope of this paper. The reader who is seriously interested in this theme is referred to the following text for an introduction to some of the deeper problems: *Ikono-graphie und Ikonologie*, ed. Ekkehard Kaemmering, Cologne: Dumont Taschenbücher, 1979, (Bildende Kunst als Zeichensystem, 1)..

¹⁷² A first outline of this approach was given in the author's: "A New Classification for Art," *Die Klassifikation und ihr Umfeld. Proceedings 10. Jahrestagung der Gesellschaft für Klassifikation eV*, eds. P. O. Degens et al., (Frankfurt: Indeks Verlag, 1986), pp.77-84, (Studien sur Klassifikation, Bd. 17).

¹⁷³ Annaliese and Peter Keilhauer, *Ladakh and Zanskar. Lamaistische Klosterkultur im Land Zwischen Indien und Tibet*, Cologne: DuMont Buchverlag, 1981. Particularly interesting in this context is their discussion of the Padmasambhava Feast in the Monastery of Hemis.

¹⁷⁴ The original Buddha (Adibuddha) has five emanations as Vairocana, Akshobhya, Patmasambhava, Amitabha and Amoghasiddhi. See Keilhauer as in note above.

¹⁷⁵ Because they are based on an oral tradition the myths of the connecting goal are typically dynamic models which change with each version and with each generation. By contrast, the ordering function, because it is typically based on a fixed model, is closer to the static model associated with print culture, whereby one model has multiple applications in different media, at different scales.

¹⁷⁶ In all likelihood these two phases, basic needs and myths evolved in tandem. In the absence of clear documentation we cannot, however, be very certain about precise conditions in pre-historical times.

¹⁷⁷ Potentially this process could be expanded to include acoustic, tactile and olfactory expressions. Note, however, that such expressions cannot be compared in common by two or more persons in the way that is possible with visual and verbal expressions. Cf. William M. Ivins Jr., *Prints and Visual Communication*, Cambridge Mass.: Harvard University Press, 1953. Reprint as paperback: Cambridge, Mass.: MIT Press, 1969.

¹⁷⁸ Many are of course aware of the important cycles in the Reichenau, bordering on Switzerland. But there are many others. See, for instance, a number of works in the series Schweizerische Kunstführer published in Basel, later Bern:

Andreas Moser	<i>Kirche Zweisimmen</i>	1959
Marcel Strub	<i>L'eglise de Ressudens</i>	1962
“ “	<i>Kirche Belp</i>	1964
Ernst Murbach	<i>St. Martin in Zillis</i>	1965

Ernst Murbach, Emil Weinauer	<i>Kirche Oltingen</i>	1967
Emil Brunner	<i>Galluskapelle von Oberstammheim</i>	1970
Hans Rudolf Heyer, Ernst Murbach	<i>Dorfkirche Muttentz</i>	1976
Markus Bamert, Oskar Emmenegger	<i>St. Maria In Pontresina</i>	1977
Alfred Wyss	<i>Razen, Sogn Gieri</i>	1977
Marèse Sennhauser-Girard et al	<i>St. Johann in Müstair</i>	1986
Cf. the Legend of the true Cross in: Walter Hugelshofer	<i>Die Kirche von Wiesdangen</i>	1970

I am grateful to my friend, Professor André Corboz (now Geneva), for making me aware and providing me with information concerning these examples.

¹⁷⁹ See: <http://funnelweb.utcc.utk.edu/~jftzgrld/MBh1Home.html>

¹⁸⁰ Homer

¹⁸¹ Virgil

¹⁸² See: <http://www.geocities.com/Hollywood/Academy/8100/index.htm>

¹⁸³ Dante Aleghieri

¹⁸⁴ Al Firdusi

See: <http://www.persian.com/ferdowsi/>

¹⁸⁵ Potentially this also obtains in large countries such as the United States. However, the US tendencies towards mono-culture as reflected in the motto, *E pluribus unum*, undermines their multiculturalism.

¹⁸⁶ The French situation is further complicated that the national body for museums (*the Réunion des Musées Nationaux*) is under the Ministry of Culture, whereas the most important single museum in the country, the Louvre, is not.

¹⁸⁷ *Tibetan Medical Paintings*, ed. Yuri Parfionovich, Gyurme Dorje, Fernand Meyer, London: Serindia, 1992

¹⁸⁸ Ranjit Makkuni, "Museum of the Future, N-Dimensional: Project Gita-Govinda," *Xerox PARC Technical Report*, 1992.

¹⁸⁹ Jack Goody, *The domestication of the savage mind*, Cambridge: Cambridge University Press, 1977.

¹⁹⁰ See: <http://www.wbenjamin.org/links.html#writings>.

¹⁹¹ Benjamin Barber, *Jihad vs. McWorld*, New York: Times Books, 1995.

¹⁹² Peter Murray Rust, Lesley West, "Terminology, Language, Knowledge on the Web: Some Advances Made by VHG," *TKE '99. Terminology and Knowledge Engineering*, Vienna: TermNet, 1999, pp. 618-624.

Cf. <http://www.vhg.org.uk/pub/pub.html>

¹⁹³ This has recently been discussed in another context in the author's opening keynote for the Terminology and Knowledge Engineering (TKE '99) Conference:

"Conceptual Navigation in Multimedia Knowledge Spaces," Innsbruck, 1999.

¹⁹⁴ I am grateful to Preside Francesca Bocchi (Bologna) for this reference.

¹⁹⁵ Or "personkind" as some prefer to say these days.