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## **Electronic Media and Levels of Interpretation**

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### **1. Introduction**

There is much talk of an electronic highway whereby persons will have unlimited access to television stations, have video on demand and eventually have electronic versions of books, paintings, and other materials from the great libraries and museums of the world in every household. There is talk of convergence as various problems of pipelining resolve themselves. This emphasis on form means that many questions of content remain unanswered. For example, how will users navigate among millions of records without getting hopelessly lost? One solution is a System for Universal Media Searching (SUMS, Copyright 1992) which is being developed at the McLuhan Program.

This entails a principle of three basic domains of knowledge: namely, pointers, objects and interpretations. Pointers are the tools to get at knowledge, i.e. classification systems, dictionaries, encyclopaedias, bibliographies and partial contents in terms of abstracts, tables of contents and indexes; the kinds of materials which we usually find in reference sections of libraries. Objects entail full contents, namely electronic facsimiles of books, paintings, instruments and other sources of knowledge. Interpretations are various attempts to describe and analyse those contents, namely the subjective dimensions of knowledge ranging from well based claims to conjectures and opinions. Four kinds of interpretation are distinguished, internal, where the focus is on the object itself; external, where an object is compared with other objects; restorations, where an object already has built into it the interpretations of a restorer and reconstructions where an object has built into it the interpretations of those who reconstructed it (fig. 1).

Pointers      1. Classification Systems

	2. Dictionaries
	3. Encyclopaedias
	4. Bibliographies
	5. Partial Contents (Abstracts, Indexes)
Objects	6. Full Contents (Books, Paintings, Instruments etc.)
Interpretations	7. Internal
	8. External
	9. Restorations
	10. Reconstructions

Fig. 1. Basic domains and levels of knowledge.

Basic characteristics of these three domains have been discussed elsewhere<sup>1</sup>. This paper focusses more specifically on problems of interpretation and explores how these will be transformed by the advent of computers. Our concern is not with obvious claims that the speed of computers will inevitably make electronic versions of materials much more accessible, but rather with a paradoxical suggestion: that the impact of computers lies not so much in translating what exists in analogue form (print, video etc.) to digital form, but rather in generating unprecedented amounts of interpretation in the form of additional description and commentary, thus bringing to these fields new levels of systematic study. There are precedents for this phenomenon. As Giesecke<sup>2</sup> has shown conclusively, the advent of printing in the West was much more than a simple process of translating manuscripts into printed books. Printing meant that authors could no longer predict their audience and hence needed to make explicit many more things. Thus what began as an attempt to translate knowledge from one medium to another, led to a transformation of knowledge. Description established itself as a conscious activity.

Why should translation from print to electronic media introduce a new transformation in knowledge? A simple answer would be that we only organize and treat systematically that for which we have tools to organize. In oral cultures a librarian could scarcely catalogue ideas in the heads of local chieftains. In manuscript cultures without a standardized system of spelling there were limitations to how effectively things could be catalogued alphabetically. In print cultures standardized spelling permitted alphabetical lists, but the linear nature of print meant that multiple access through variant names remained tedious, and often difficult or infeasible. Electronic media enable standardized names and lists of variants to be fully integrated.<sup>3</sup> In print culture, lists are typically limited to card catalogues with names, titles and places. Hence lists are effectively pointers. Actual contents are elsewhere in separate books which need to be consulted one at a time. In electronic culture, digital lists contain not only pointers but also full contents. Hence the amount of material that can be systematically accessed and arranged is much larger. How will translation from print to electronic media transform knowledge in the realm of interpretation? Examples will be considered in terms of internal and external analyses, restorations and reconstructions. Implicit interpretations with respect to pointers will also be examined.

By way of introduction it is useful to note that the term interpretation means a number of things. In general it is used loosely as synonymous with analysis, insights, commentaries or hermeneutics. In the thirteenth century four types of interpretation were identified: literal, metaphorical, allegorical, and anagogical. To avoid confusion we shall refer to these as interpretative modes, using interpretation as the general term within which a variety of types are identified.

## 2. Internal Analyses

Internal analyses focus on trying to understand the object itself. In this context the most basic type of interpretation requires describing contents, i.e. identifying persons and objects, their characteristics and their contexts in a book or a picture. Another approach lies in interpretative modes. A third lies in analysing grammar and other linguistic features. Each of these will be considered in turn.

## 3. Identifications

For the purposes of this paper eleven kinds of identification are outlined (fig. 2).

1. Who? Names etc.
2. What? Positions
3. Actions
4. Motions
5. Emotions
6. Relations
7. Narrative Contexts
8. Costumes
9. Ornaments
10. Where? Places
11. When? Events

Fig.. 2. Eleven kinds of identifications.

### Names

Basic identifications entail the name of an individual or object, plus their gender, size, age, etc. In the case of literature such identifications can in large part be automated. For instance, in the case of the *Old Testament*, one might begin with Christian biographical dictionaries and encyclopaedias, collate these to create a master list, check for each of these names and the number of occurrences thereof in the *Old Testament*. Hence a person wishing to identify Moses would be told which biographical dictionaries describe him, how long each description is and permit the user to consult any or all of these. In terms of basic domains and levels of knowledge (fig. 1) this entails linking a subset of names and their accompanying descriptions (in levels two and three) with corresponding names found in the full contents of a book (in level six) to arrive at preliminary lists (for level seven). If a user wished to pursue this question of identification, the computer could check for the existence of this name in classification systems (level one), bibliographies

(level four) and partial contents, e.g. key words, (level five). This approach could be adapted for any fictional or historical name in any type of literature, be it Shakespeare or Churchill.

In the case of paintings, identifications vary enormously in level of difficulty. Some paintings have the name of an individual written beside their image such that it is merely a question of reading the name. Often context makes identification easy. If a Christian sees a painting of a man on a cross surrounded by two other persons on crosses on a hill they will quickly recognize this as Christ on the Cross at Golgotha. Saints in Christian paintings typically have attributes. Some of these are well known: e.g. St. James has a scallop shell; St. Roch has a plague wound on his leg.. Others require experts to consult their copy of Reau.<sup>4</sup>

At least some of these identifications in paintings are recorded in titles such as *Virgin and Child surrounded by Saints John the Evangelist and John the Baptist*. Others are recorded in the catalogue cards of galleries and museums as well as in specialized databases such as the *Princeton Index of Christian Art*. If these identifications in titles, catalogues etc. are correlated with names in various types of pointers then these connections can again be automated. The sceptic will note that titles are not always accurate or may entail controversy. In such cases scholars have usually suggested alternative titles with different names. So one simply needs to add a function whereby users are apprised of controversies and provided with alternative readings.

In the long term the computer can be taught to recognize the kind of name that is involved: e.g. David and Jonathan are (originally) *Old Testament*, *Patroclus* comes from Homer and thus automatically provide basic facts and take the reader into narrative context (see below) if they so desire.

### **Positions**

As is the case throughout various levels of SUMS, individual sections reflect different forms of the basic questions who?, what?, where?, when?, how?, why? Hence having identified names (who?), the next identifications entail characteristics of the person (what?). The first of these is positions. In the case of literature the positions of persons are traditionally identified using simple prepositions such as: front, back, above, middle, below, facing right, facing left. In the past scholars might comment on the exact position of Achilles at a crucial moment in the story but the task of recording every position of every figure described in the *Iliad* would have been much too tedious to make sense. In the case of art the development of specialized systems such as *Iconclass* (Leiden, Utrecht) are providing a context for systematic descriptions of this kind. So too are major projects such as the *Lexicon Iconographicum Mythologiae Classicae*. In future, computers can automate aspects of this task and thus open up a whole range of new questions. Are the positions of Greek heroes and heroines fundamentally the same as those of mediaeval romances and renaissance stories? If there are changes to what extent do these vary culturally, from country to country and continent to continent? Are there

parallels between European, Chinese, Indian, or North and South American positions or are they different? In what ways are they different? What do these differences mean?

### **Actions**

That which applies to positions applies also to actions such as dancing, drinking, eating, fighting, playing, reading, singing, sleeping, thinking, working. The computer could again record automatically which actions are used to describe individuals in a story. Various forms of verbs could also be recorded, such that one could study not only trends in actions described but also trends in the use of tenses. Do given cultures focus on certain action verbs more than others? Do some focus on past or future as opposed to present tenses? Do they focus on active rather than passive tenses? If so what might this mean?

### **Motions**

This same approach can be applied to basic motions of an individual such as carrying, kneeling, leaning, lifting, lying down, pulling, pressing down, running, sitting, standing, supported, suspended, thrusting. Are heroes and heroines in epics given different motions from others? Do these vary culturally and /or historically? What can one learn from these changes?

### **Emotions**

One could also use this approach with respect to the inner emotions, or passions as they are called in French, such as anger, ecstasy, fear, joy, sorrow, suffering. In the case of art, there is a tradition of illustrated texts showing images of these passions which could be scanned in and then used as a basis for pattern recognition.

### **Relations**

Knowledge concerning relations between persons could also be automated by computers by searching systematically for prepositions such as against, at, away from, from, to, towards, and with. In the case of paintings one can also search for these prepositions in titles and catalogue entries.

### **Narrative Contexts**

Literary allusions, especially classical allusions have traditionally been a basic characteristic of cultured persons. In certain circles one could take for granted that a reference to David and Goliath, or even David and Jonathan would evoke events from those stories in the *Old Testament*; that references to Icarus or Tantalus, to Francis of Assisi or Saint Vincent Ferrer would not require explaining their stories. All this has changed, partly because persons no longer view reading a corpus of great literature from Homer through Sartre as a necessary dimension of being civilized and this for at least two reasons. First, the traditional corpus has been recognized as sadly Eurocentric, such that one should

theoretically expand its scope to include the great literature of China, India, Japan, Iran, Iraq, Turkey and many other countries. Second, sensitive readers have discovered that study of the greats has overshadowed the achievements of many other authors with their own intrinsic worth. As a result some would now have us study everyone. This is beyond anyone's capacities and as a result there are a myriad answers as to what the reading list should include. Net result: even scholars no longer have a common corpus that they can assume their colleagues will have read.

Much of the knowledge concerning this lost common corpus can be automated. A number of basic sources ranging from the *Bible*, *Patrologiae Latinum*, *Patrologiae Graecum* and Kaftal's *Lives of the Saints* have been or are being digitized. If this list is expanded to include fairy tales, legends and mythologies from all countries, not just Europe, then these materials can be arranged (in levels two and three) and linked to names in full contents of literature (at level six) to provide narrative contexts (at level seven). If, for instance, a person is reading a text and comes across a reference to Socrates, the computer would know that Socrates was an allusion to an historical figure in Ancient Greece, provide his dates, references to descriptions by Plato and other classical authors (e.g. Diogenes Laertius) and a list of secondary literature on Socrates (e.g. Jaspers). Hence far more than simply identifying a figure the computer would provide readers with their full narrative contexts (cf. fig. 3). This would prepare the way for studies showing the extent to which a given narrative context and cultural heritage influenced a literary work.

### Costumes

Records of costumes are another feature that can be partially automated such that one could study their continuity over time, how they become linked with local, regional and national sentiments, how the detail with which they are described varies tremendously from one culture to another.

1. Bible
2. Fairy Tales (e.g. Grimms)
3. Historical Figures
4. Iconclass
5. Lives of Saints (e.g. Da Voragine)
6. Legends
7. Mythologies
8. Patrologia Latinum
9. Patrologia Graecum

Fig. 3 . Nine examples of narrative contexts.

- |                 |                       |
|-----------------|-----------------------|
| 1. Equivalence  | statue equals god     |
| 2. Substitution | statue represents god |

3. Euhemerism	painting represents man as if god
4. Symbolism	" " <i>a</i> but means <i>b</i>
5. Literal	" " <i>a</i> and means <i>a</i>
6. Allegorical	" <i>Old Testament</i> and means <i>New Testament</i>
7. Moral	" Christ's actions in relation to man
8. Anagogical	" Christ's actions in relation to eternity
9. Guisal	" <i>a</i> in the guise <i>aI</i>
10. Playful Guisal	" <i>a</i> in the playful guise of <i>aI</i>

Figure 4. Ten basic categories of interpretative modes.

### Ornaments

Descriptions of ornaments (jewelry, armour, shields) are yet another characteristic that can be partially automated. What jewels are described? What combinations of jewels? In what detail are they described? How much do these descriptions change from culture to culture and from one period to another?

### 3. Internal Interpretative Modes

Dante defined four basic interpretative modes, namely, literal, allegorical, moral, anagogical. A series of other possibilities bear attention (fig. 4) including, equivalence, substitution, euhemerism, symbolism, guisal, (when the Duchess of X is represented in the guise of the goddess Diana) and playful guisal, (when this is done in a playful way as when Boucher paints a man in the guise of Mercury and depicts small wings at his feet tied on by ribbons).

Each of these interpretative modes can be seen in terms of increasing levels of abstraction, from cases where an object is identified with the god or goddess it represents (as in totemism), to cases where this link between represented object and original is purely playful. Some of these aspects are evident from the titles of paintings or descriptions in texts and can hence be recorded automatically. Many of these modes cannot be analysed automatically with present tools. Insights from secondary literature could, however, be collated and used for this purpose.

### 4. Internal Linguistic Analyses

In addition to characteristics which can be automatically computed or collated from existing secondary literature, there are other grammatical and linguistic characteristics which can be explored in accordance with a user's individual interests using software tools such as Freebase, Collate, Micro-OCP, and Tact. The extent to which these analyses remain as personal notes, comments shared on a bulletin board or become part of the

Who?	Persons	
What?	Objects	Comparisons
		Development
		Practice-Theory

		Abstract-Concrete
		Universals-Particulars
Where?	Places	Locations
		Scales
When?	Events	
How?	Instructions	
Why?	Reasons	

Fig. 5. Some examples of external analyses.

accepted corpus of commentary and interpretation will depend on peer groups within various specialized fields.

## 5. External Analyses

There is a basic difference between internal and external analyses. In internal analyses the primary reality of the person or object lies within the book or painting. In external analyses the figure is related to other literary, historical or artistic sources. These external characteristics can again be seen in terms of basic questions, namely, who?, what?, where?, when?, how?, why? (fig. 6).

As some examples of these have been considered elsewhere,<sup>5</sup> they will not be further described at this point. As in the case of modes of interpretation these characteristics will need to be gleaned from existing secondary literature. In future a revision of rules for scholarly publications will be required, whereby electronic versions of articles and books become an integral part of scholarly activity. In so doing hitherto isolated insights concerning a particular book or painting will become part of a cumulative corpus.

## 6. Restorations

Restorations are included as a level of interpretation because these objects have built into them often tacit interpretations of earlier restorers. Some of the tools used in distinguishing originals, retored versions, simulated and actual interventions are listed below (fig. 6). The details of this level will be the subject of a later article.

1. Written Descriptions
2. Drawings
3. Photographs
4. X-Rays
5. Ultra-Violet Rays
6. CAD
7. Virtual Reality

Fig. 6. Some basic tools used in restorations.

Intact

1. Critical Versions
2. Proportions

### 3. Perspective

Non-Intact

4. Ground Plans

5. Models

6. CAD

7 Virtual Reality

Fig. 7. Examples of reconstructions.

## 7. Reconstructions

Reconstructions may be described as visual interpretations. These are of two basic kinds: a first where the original object is intact and the role of the reconstruction is to provide new dimensions of analysis; a second where the original object is no longer intact and the reconstruction suggests how it might have looked when it was still intact. Intact reconstructions include a) critical versions, in cases where the actual diagram is considered incorrect or where reconstructions are used to interpret ambiguous aspects of a diagram; b) cases in which the proportions implicit in a diagram are added and c) in which the perspectival lines are superimposed on a picture.

Non-intact reconstructions include cases within objects, between objects, and sites. They may also involve existing elements in context, as in the case of the Roman Forum where some buildings are still partially standing. Sometimes these existing elements have been moved elsewhere, as in the case of the Elgin Marbles now in the British Museum which were originally part of the Parthenon on the Acropolis at Athens. Here the challenge lies in showing where and how the parts in London would have fitted into their original location in Athens. Sometimes these relationships are best revealed through hierarchies of related parts, i.e. showing how a base and capital relate to a column and how these relate to specific parts of a Greek or Roman temple or other buildings. A more difficult case, of course, is when the elements being put into context no longer exist in their original form. The columns may be strewn all over the ground as with the temples in Selinunte or the original(s) may have been carted away and used for other buildings as in the case of parts of the Coliseum.

## 8. Implicit Interpretations in Pointers and Objects.

Levels seven to ten in our basic schema (fig. 1) entail cases of explicit interpretation, i.e. where a scholar or individual is consciously describing, commenting on or analysing a passage of text, a painting or other object. These constitute the most obvious kinds of interpretation. In addition to these there are implicit interpretations which apply to all levels. For example, systems of classification entail different philosophical and psychological assumptions about how knowledge should be cubbyholed. A librarian and more so a reader using a particular system may well forget that this is but one of many possibilities of organizing the genera and species of knowledge. In the case of explicit interpretations an attentive user would be expected to write a new commentary or make a fresh analysis to demonstrate the limitations of the existing system. In the case of

classification systems, only the rarest of individuals such as Bliss or Ranganathan will take it upon themselves to create an alternative system. A few librarians may write specialized articles suggesting emendations to a system such as Dewey or Library of Congress especially in the case of new topics such as virtual reality which did not exist previously. Most persons will content themselves with becoming conscious that the categories which seemed unshakeable are in fact provisional at a higher level. Similar principles hold with respect to definitions and explanations in dictionaries and encyclopaedias as well as partial contents in the form of abstracts. These too are implicit interpretations.

With respect to these implicit interpretations in the realm of pointers, computers may well stimulate many new classifications, definitions and explanations and abstracts. But their more immediate role will be to make accessible the many alternative versions that have hitherto not been widely known, thus allowing users to recognize more clearly the implicit interpretations and limitations of any given system, definition, explanation or partial contents in the form of abstracts etc.

Even in the case of full contents there are implicit interpretations inasmuch as many representations of original objects are taken from a specific point of view which brings some aspects into focus and leaves other aspects out of focus. Here computers can play another role. For if hitherto isolated views are co-ordinated such that one can reconstruct what an object would look like from all sides the limitations of a single viewpoint at a time would be overcome.

## **9. Problems of Truth**

Many recent developments in electronic media seem to be undermining our criteria for veracity and truth. This is particularly evident in recent films. In *Jurassic Park* it is well nigh impossible to distinguish dinosaurs based on mechanical models from those created by computer graphics. In *Last Action Hero*, the young protagonist moves seamlessly back and forth between the physical world and the fictive world of the screen. In *Cliffhanger* the scenes move constantly between the Rocky Mountains in Colorado and the Dolomites in Italy. These examples could be seen as part of a larger trend characterized by new terms such as *info-tainment* and *edu-tainment* whereby boundaries between realism and phantasy are being eroded such that documentaries and situation comedies are becoming indistinguishable; whereby the CNN report of a war is just another form of diversion and entertainment. Some might see developments in interpretation outlined above as yet another manifestation of these trends. In this view computers would be a culmination of trends towards seeing knowledge in terms of psychology and sociology which began seriously in the late nineteenth and early twentieth centuries. Hence computers would primarily be instruments of a new relativism.

These developments can, however, be looked at in a quite different light. Persons accustomed to only one language, classification system, definition, explanation, version of a title etc. are likely to assume that there is something ontological and absolute about

their univalent framework for analysis. To give such persons access to different versions of each of these tools could appear as an admission of purely subjective relativism, but it is not. The existence of different definitions for a term does not remove the need to record and reproduce accurately and truthfully the contents of those definitions.<sup>6</sup> Indeed persons can become more conscious that their own approach is but one of many genuine alternatives.

By distinguishing clearly between different domains of knowledge, namely, pointers, where interpretations are implicit; objects, where interpretations enter through the viewpoints from which the object is recorded and interpretations where the subjective element is explicit, the computer can play a vital role in organizing knowledge such that we can keep separate objective and subjective aspects. Hence instead of threatening our sense of truth electronic media can potentially be vital tools in upholding and fostering it. To achieve this requires an electronic equivalent of footnotes which will document the sources of texts, pictures, videos and other media, the precise conditions under which they were recorded and edited.

## **10. Conclusions.**

Most of the elements of interpretation outlined above are not new. They have been known to and used by sensitive scholars over the past centuries. Even so the ways in which these elements are used is changing radically. Traditionally a scholar focussed on isolated elements making no pretense that these were in any way comprehensive or exhaustive. The results were recorded in a study. For a time these studies became learned letters which were sent to a small circle of friends. In the eighteenth century as the notion of a republic of letters spread, these learned letters became a starting point for the *Acts of the Erudite* (*Acta eruditorum*) and similar collections which evolved into learned journals. While this had the advantage of publishing many insights which would otherwise have remained in manuscript, it meant that specialized insights were scattered throughout these journals and that potential cumulative effects thereof remained invisible. New microfiche versions of some of this literature in the past generation did not change this pattern in a fundamental way.

Many persons see the computer revolution in terms of increased efficiencies which come with translating existing materials into electronic form. This paper has argued that the greater part of the revolution lies elsewhere. First, some aspects of interpretation which previously posed too daunting a task to researchers, can now be organized more efficiently while others can be automated. Second, the translation of these materials into digital form means that isolated insights of scholars which hitherto remained dispersed will become accessible in cumulative form. Third, and by no means least, in providing tools which allow interpretations of these materials to be largely automated, computers will create a whole new corpus of commentaries. In short the computer revolution is not about form. It is about new content.

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## Notes

<sup>1</sup> See the author's "A System for Universal Media Searching (SUMS), *Computers and the History of Art*, London, 1994, (in press) and "Electronic Media and Visual Knowledge", *Knowledge Organization*, Frankfurt, vol.20, no. 1, 1993, pp. 47-53.

<sup>2</sup> Michael Giesecke, *Der Buchdruck in der fruhen Neuzeit. Eine historische Fallstudie uber die Durchsetzung neuer Informations-und Kommunikationstechnologien*, Frankfurt am Main:Suhrkamp, 1991.

<sup>3</sup> For a more thorough discussion see the author's "Past imprecision for Future Standards: Computers and New Roads to Knowledge, *Computers and the History of Art*, London, 1993, pp. (in press).

<sup>4</sup> Reau, *L'Iconologie Chretienne*, Paris: vol.

<sup>5</sup> See the author's "Can Museum Computer Networks Change Our Views of Knowledge?": *Museums and Information. New Technological Horizons. Proceedings*, Ottawa: Canadian Heritage Information Network, 1992, pp.101-108 and the articles cited in notes one and three above.

<sup>6</sup> The extent to which reformulation is possible depends on the topic. Scientific facts are less flexible than some artistic terms. For instance, the temperature of boiling water has clear parameters once one has defined a scale of measurement.