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HYPERICONICS: Hypertext and the Social Construction of Information about the History of Artistic Notions

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Some 25 years ago the Leiden art historian Van de Waal, inventor of ICONCLASS, developed an 'icon knowledge system' called Beeldleer. After a brief review of this system the author does borrow some central ideas of Beeldleer to discuss a method of studying historically the elementary means of artistic expression with the use of hypertext concepts. The potential of a social construction of information in this field is being emphasized. Finally the design of a pilot study in an educational context will be discussed. (Author)

0. Prologue

In the past few years an immoderate enthusiasm for a new method of approach in the exchange of information has become detectable in circles of information scientists, a method of approach which is made practicable by means of the technology of *hypertext* or *hypermedia* systems. The appearance of this model of computerization "promises (or threatens) to produce effects on our culture [...] just as radical as those produced by Gutenberg's movable type" (1). Just as the `Ars Memoriae' were once developed to support the individual memory of orators in antiquity, in order that they might proclaim their speeches on classical platforms as vividly as possible (2), so a part of the present software market consists of various hypertext implementations, which facilitate the building of an immediately available `collective memory'. The model of knowledge representation that is being adhered to here has been described, amongst others, by Barrett and Bruffee. It is the model of a `social construction of meaning / information' (3). However we explicitly do *not* intend to express ourselves about the question of whether the concept of hypertext might be a good metaphor for general memory processes in the human brain.

In this article the hypertext concept is used to indicate the possibilities of a formalized method of describing concerns relevant to the work of art as a visual phenomenon (that is the 'means of artistic expression', or, in other words, the 'pictorial properties'). Our concerns will thus be with *how* artists represent, symbolize or express in their work rather than with *what* they represent, symbolize or express. We shall concentrate on two matters: the problem of the means of expression in itself and the nature of the exchange of thoughts amongst art historians (which Oskar Bätschmann terms a *kunstgeschichtliche Argumentationsgemeinschaft*) (4). We shall wish to consider these two issues together in terms of both education and scholarship. By nature the hypertext concept is very suitable for educational purposes and it is in an academic educational context that we have initiated our first pilot project. We are also interested in the formation of *ideas* concerning the means of artistic expression among art historians of the scholarly community. We shall suggest that the boundary between education and scholarship could fade in the era of hypertext systems.

For the sake of argument we shall claim that nowadays the use of computers in the history of art is rather successful where essentially *images* were (once) used to make *words* come true. A system like ICONCLASS, for example, could in principle be mapped out largely *without* the observation of works of art. Problems arise, on the other hand, where words need to be used to make the expressive/qualities of images come true; that is exactly the opposite. The expressive formal qualities of images are in a very real way problematic for a culture which has been dominated by words for so many centuries (see for example (5)).

Some experiments with processing and analyzing digitized images in art history have been performed on a small scale (see for example (6-8))[1]. In general, however, these experiments have had few preoccupations with textual sources, commentaries, scholarly interpretations and the like: i.e., computer-assisted research on the images of art history has had little to do with computer-assisted research on textual sources related to the history of art.

In the present article we shall concentrate on matters of form, on the visual qualities of works of art. A computer application which is meant to provide a serious contribution in this field should ultimately be able to deal with both ordered commentaries in textual form, as with arrangements of visual images that have been accomplished *without* the use of (ordered) texts (in any arrangement of texts the historical dimension is prominent; in the arrangement of images *as* images the historical dimension is absent and only at a second glance does it seems to play a philosophical role). Since in the end both approaches need and complement each other, we shall search for a method that will enable the integration of both points of view.

To begin with, we will examine a project dating from the sixties, in which many of the above designated bipartite problems are recognizable. It has never been published and for that reason is practically unknown: *Beeldleer* ('Icon Knowledge System') of the late Henri van de Waal, professor of art history at Leiden University and inventor of ICONCLASS. Van de Waal's *Beeldleer* functions as a point of departure. Subsequently we shall deal briefly with the issue of hypertext in general, after which the concept of `hypericonics' will be discussed. This term signifies the application of hypertext-concepts within our notion of the pictorial properties of a work of art (that which Max Imdahl in German language has labelled *Ikonik*, the `doctrine of the pictorial' (13)).

The practical elaboration of our subject-matter will consist of two parts. Starting with the assumption that in an educational environment the bigger world of an *Argumentationsgemeinschaft* of art historians may be simulated, we will give an account of a tangible 'hypericonic educational system', in which the presence of textual arguments for the relationships between artistic notions is typical. The important problem of the criteria for selection - what to record and what not? - can up to this point be passed-by ("the master disposes"). The review of this hypericonic system is as much as possible kept independent of the supply of hypertext systems on the present-day market. Finally our thoughts on hypericonics will further be elaborated in what we have labelled a 'hypericonic research system'. In this article we will not undertake that mission in practice. We will only roughly discuss what might eventually supplement or replace the textual arguments that support relationships in our more primitive hypericonic educational system, and in what way a trusted set of editors might assess the contributions of authors on the history of artistic notions.

If there will ever be a hypericonic *docuverse* or a filled in *System of Universal Media Searching* in the sense of Kim Veltman (14), is open to speculation, but certainly the time is ripe for *hypertext beeldleren* for personal or local use. Therefore in the Epiloque we shall focus on the issue of the desirability of the developments that have been described.

1. Theoretical Argumentation

1.1 The art historical interest

In a concrete work of art the artist has always used, more or less consciously, whether successful or not, a diversity of means of expression. The work of art may be conceived as a more or less successful 'weighing' of means of expression. Just as histories of art may be written, one may also write a history of the means of expression accepted in art. Ideally a review of ideas, together with the use of (certain) means of expression, will be included in such a history. Twenty years ago, Giulio Carlo Argan contemplated on this as follows: "If it is possible to do iconological history of perspective, proportions, anatomy, representational conventions, symbolic references of color, and even rituality and gesturality in technique, no one has said that it must stop there and that it is not possible to study historically, like so many iconologies, line, chiaroscuro, tone, penstrokes, and so forth" (15). An example of such historical discourses can be found in the article about *Chance Images* by Horst W. Janson in the *Dictionary of the History of Ideas* (16).

When discussing the history of a means of expression in art, obviously one must consider the illustrations of works of art, conceptions of artists, art theorists, -historians, -philosophers and -critics, comments from users of the system, descriptions of the works of art and also, possibly, mechanically established resemblances between works of art. One of the undertakings in the past in which means of expression were extensively pursued is Van de Waal's *Beeldleer*[2].

1.2 Van de Waal's 'Beeldleer'

1.2.1 The constituent parts

The classification scheme of *Beeldleer*, which was developed by the Leiden professor Henri van de Waal until just before his death in 1972, consists of more than a thirty pages[3]. It is an ingenious system, in which very divergent aspects of the possible contacts with 'art' have been arranged with an hierarchical appearance, while referring to one another in an (art historically) significant way.

One will come across such notions as Exhibition practice, Chiaroscuro, Symmetry, Psychology of the maker... and the like. This central part of *Beeldleer* is essentially a *container*, an outline of abstract connections between ideas. Every idea is supplied with a notation, in which the hierarchical position of the item within a greater context is laid down. The summary is furthermore provided with an index, containing, in the latest version, the 600 terms (hereafter called *items*) which can provide access to the classification.

In addition to this abstract frame, Van de Waal's inheritance also contains rather extensive collections of *contents*. Van de Waal himself, his fellow workers, and presumably his students too, were involved in the construction of the entire work. This body of material is partly public and partly private. It was neglected for more than twenty years. The material consists of texts on standardized notecards or in folders filled with diverse drafts and cuttings. Furthermore there are images and a collection of slides which were meant to be used in educational practice. A *Beeldleer* notation has been attached to each separate part of the *contents*.

A global analysis of the cards reveals that the vast majority of data consists of references to literature, in particular to articles. Often local registration numbers have been included. Comparable to this are the references to visual works of art and, to a lesser extent, literary texts (sometimes literally quoted) or pieces of music. Many of the references are provided with a short explanation. On these cards one may also come across abstracts, pronouncements by artists and other full length quotations, etymological and thesaurus-like annotations (*related terms* for

Figure 1. A fragment of the original Beeldleer-classification

hierarchical arrangement		related terms
4	RUIMTE	
[...]		
46	Beweging	
46.1	Tijd	bij icon geen tijdscategorieën 13.1
46.2	Tijd - ruimte	
46.3	Elementen van beweging	
46.31	Handeling	continuerende uitbeelding 45.1 invl. v. momentopname 46.44
46.31.1	Dramatische theorieën	ader - literatuur 43.9
46.31.2	Moment als onderdeel van handeling	ort ogenblik, tijd v. waarn. 22.61 gebaar niet - moment 56.21.1
46.31.3	Reeks van momenten (strip-vorm)	con - literatuur 16.1 icon - film 16.4 reeks van meer dan 2 bijeenbeh. kunstw. 37.31 bewegende beelden 46.7
46.32	Elementen van compositie	likrichting 22.2 richting in compositie 33.5
46.32.1	Verticaal	
46.32.2	Diagonaal	
46.33	Elementen van ordonnantie	
46.33.1	Diagonale opstelling	
46.4	Suggestie van beweging	
46.41	Mens in beweging	
46.42	Dier in beweging	
46.43	Voorwerpen in beweging	
46.44	Invl. van foto (momentopname) op uitb. v. beweging	con - film 16.4 foto als tijdloupe 22.61.1
46.5	Thema's van bewegingsuitbeelding	
46.6	Ontwikkeling van uitbeelding van beweging	eprod. v. kunstw. in film 11.86 icon - film 16.4 reeks v. momenten (strip-vorm) 46.31.3
46.7	Bewegende beelden	
46.71	Diverse apparaten (alf.)	
46.8	Bewegende kunstwerken	
46.81	2-dimensionele kunstwerken	
46.82	3-dimensionele kunstwerken	

example), 'double' references (where the card serves as a *connection*) and references to other notations in *Beeldleer*. A striking amount of care has been bestowed upon the mention of source materials.

1.2.2 How has the *Beeldleer* been divided?

The *Beeldleer* system has 8 main categories: 1.General methodology; 2.Vision; 3.Form (matter and structure); 4.Space; 5.Semantics; 6.Functions of the icon; 7.Appreciation; and 8.Theory of Style. For those who wish to take up a specific art historical problem this card system may provide a notion of that problem within the total field of art history. If one decides, for example, to write something about the action (*handeling*) in Manet's works of art, one will pass through...

4 *SPACE;*
46 *Movement;*
46.3 *Elements of movement;*

to finally arrive at...

46.31 *Action.*

The system then shows at a single glance that it may be worth while also to take notice of...

46.31.1 *Theories of drama;*
46.31.2 *The momentarily as a part of action;*
46.31.3 *Moments in a series.*

These are possibly inferior aspects of an action. The system, however, also makes evident that there are certain art historical apects which may be directly related to the *handeling*.

45.1 *continuous narrative;*
46.44 *influence of photographic snapshots;*
43.9 *frame ~ literature;*
22.61 *short moments, the duration of perception;*
56.21.1 *gestures as a non-momentarily act;*
16.1 *icon ~ literature;*
16.4 *icon ~ motion pictures;*
37.31 *series of more than 2 works of art belonging together;*
46.7 *moving images.*

There are, in other words, *narrower terms* and *related terms*. But there are *broader terms* and *adjacent terms* too, which opens up the possibility for a particular researcher, to come across *46.44 The influence of photographic snapshots*, which might eventually influence commentaries on Manet's paintings and drawings of the *Races at Longchamp*. See

1.2.3 The possibilities of the concept

The whole of *Beeldleer* is ingenious and opaque at the same time. Ingenious is the way in which multiple connections exist between the previously mentioned aspects. After some initial browsing through the system one may realize how many mature (art historical) aspects Van de Waal has been able to incorporate in its development. The entire system might be conceived of as the crystallization of a vision of the connection between (visual) art historical matters. The system is opaque because the nature of connections between aspects is not expressed. The connections are present implicitly, not explicitly. According to J.L. Locher, one of Van de Waal's students, the *Beeldleer* system primarily served as a *pedagogical device*[4]. This may explain the lack of argumentation - why exactly this type of systematic division? A connection between things or affairs was presented to students to stimulate their reflection. Locher also emphasizes the changeability of Van de Waal's connections. *Beeldleer* came about in an educational context and it carries the traces of this context. Suggestions which arose from exchanges of views with students were worked into the system. The condition in which the system was encountered after Van de Waal's death is not 'finished'. It is doubtful whether a system such as this one can or should ever be 'finished'; insights change, connections become clearer or become blurred, new connections need attention etc. Lack of transparancy is really inevitable.

Beeldleer may therefore be taken to be the material reflection of a guided tour by a good guide, a tour past works of art and conceptions about works of art, a tour during which the guide points out the striking facets of the works and also the similarities and differences between works of art or the interpretations of these works. When the works are in museums, these museums are visited; insofar as the interpretations have been recorded in books, the books are pulled from the *endless bookcases* of libraries with *stone walls of acceptable form*. *Beeldleer* pilots those interested, in short, past many works and countless texts, which would otherwise most likely have been hidden from individual thought. Van de Waal's system is really a reflection in miniature - and on paper! - of the traditional art historical practice. Van de Waal should mainly be credited for showing his students that and how such a reflection is possible. Like Batschmann's *Bezugssystem der Auslegung* this system may not only stimulate the "reflection on ordered arrangements", it may also serve as a "mnemotechnic device" (4, p.156). In principle the system is very suitable for educational practice as well as for research activities.

1.2.4 Some limitations of the concept

Where Van de Waal's *Beeldleer* may be considered as a miniature reflection of the traditional art historical practice, one also encounters in it the limitations thereof. To become aware of this one only has to concentrate on the *elements* and *arrangement* of the system.

To begin with, the employed division is centrally coordinated. There is talk of a division of items, in which, in principle, only one place is intended for each item. This does result in a system with a very subjective character. Van de Waal's division is exchangeable for many others and it is as good as inconceivable that a similar organization could be created anywhere else in the world. This objection makes itself more felt by seeing the different

versions of Van de Waal's classifying frame: in between the lot of them the variations are limited. Within Van de Waal's arrangement, on the other hand, we see a proliferation of organizational principles. All this is, of course, connected to the ambitious intention of the system. *Beeldleer* attempts to capture the diversity of the art historical work (also in the past): the system appears to be intended as a blueprint for a general iconology (in Dutch literally: *'beeldleer'*) and such a set-up must lead to a lack of balance. Within the same frame one comes across references to the forms of pictures, psychological processes, reproductive techniques, physical laws, terminological issues, art trade, museum management etc. One of the consequences is that by no means all of the Beeldleer terms can be joined to illustrations. And if a connection between item and illustration *is* possible, then it is instructive in one case (43.11 - *'abrupt interruption'*), and just illustrative in another (11.66 - *'teaching art history'*). In short, a heterogeneous collection of items is represented in *Beeldleer* according to a quasi-homogeneous principle and although Van de Waal adjusted its systematics countless times, this way of reflecting reality is essentially *static*. Barrett formulated his objections against such a procedure in the following terms: "Any system founded upon a particular conception of mind will be partially constrained by the limitations of that initial conception. The least effective application of computing technology in the development of information systems is the sort that results in the production of static knowledge representation systems, rather than adequate tools for the construction of meaning and knowledge." (3, p.XII). (Of course we should not forget that Van de Waal developed his system in a period when information technology had not progressed far enough to facilitate realisation of all the potentials of *Beeldleer*.)

In the approach which we sketch below we strive for a *'Beeldleer* in electronic form' where everything turns on a more limited set of items in a more extensive set of arrangements. In the original *Beeldleer* attention is very explicitly paid to matters concerning the *form*, the *contents* as well as the *function* of the works of art. We place the emphasis upon the visual aspects of the works and in particular on the popularity and nature of the use of visual devices in the course of history. In contrast with Van de Waal's approach we shall not seek for more or less permanent connections between elementary means of expression. The processing power of computers may be used for immediate regrouping of items. These items are, just as points, placed in an imaginary space, after which, in principle countless alternative connective structures (among which Van de Waal's) can be placed upon these points. Each alternative may in principle be administered. Each administered alternative may, in a trice, take care of the desired connections. None of the thus originated connections needs to be soul-saving. This is the moment to roughly discuss the architecture of the hypertext systems.

1.3 Hypertext

The architecture of the hypertext systems may be contrasted with the essentially linear character of traditional script. A hypertext has an informational structure which is spatially modelled in the shape of a *web* or *network*, connected by nodes and links, by which the computer is used as regulator and keeper of records of the informational traffic. Characteristic is the freedom the user of such information systems possesses to navigate through the representative web on his own discretion. If connective structures exist between several meerdere nodes these are essentially optional. One may choose to follow a strictly guided tour, but just as well one could make the path through the informational space dependent on personal motives: a research question, the noncommittal interest for some phenomenon; perhaps one would prefer to be led by coincidence. Because present-day computers are very useful for storing texts, images and the like, the scholar in his studio will have at his immediate disposal a multiple of the information he would have been able to attain by means of traditional devices.

One of the most eye-catching effects of working with information in hypertext form is therefore the changing role of reader and writer. The reader obtains authority over matters which in the technology of the book belonged to the writer: he may not only choose his own story line, but can also add material himself. The authorship of a true hypertext corpus becomes problematic by consequence. Hypertext corpora therefore sometimes are called 'group memories' or 'shared information spaces'. There is not just one author[5].

When, in future discussions we speak of the hypertext concept as a support of a doctrine of visual devices, which might be termed 'iconics', we shall use the term *hypericonics*[6].

1.4.1 The global shape of a hypericonic system

What then are the topics of a discussion in our hypericonic approach? To begin with, these are illustrations and texts. The illustrations are directly or indirectly the subject of the texts. The texts are, however, *never* texts about entire illustrations. The texts are *always* texts about certain aspects of the illustrations. We shall restrict ourselves, as mentioned above, to the visual aspects. Illustrations, aspects of illustrations and texts about aspects of illustrations are here the three principal entities. In hypertext form it is eventually not important how these entities are scattered in space. To comprehend this concept better one might imagine three layers: the bottom layer contains all the images and the top layer contains all texts. The middle layer is a container of the interpretation of aspects; this might be called the *hypericonic vocabulary*. The middle layer works as a sluice, a sieve, and by means of this middle layer the user may *put others in a position* to give him a guided tour. So amongst other possibilities, one is able to administer the hierarchical division of Van de Waal's *Beeldleer* as opposed to this midle layer. The middle layer is the place where all systematical connec-

tions / structures are fitted in. The objects in the different layers can be localized in time and space. This applies especially to objects in the top and bottom layer. Temporal and spatial conditions may remain global. We shall work with temporal dimensions in particular. Finally some primary information about the whereabouts of images as well as texts - thus museums, books, magazines etc. - are of importance in this context. For the time being elaborate conventional documentation and registration has been consciously avoided.

The user of a hypericonic system may clear his way through varied information. Which navigational possibilities should therefore be at his disposal? Naturally the user must be able to limit himself to the various items as they were typical in a particular historical period or area: What is known about *chiaroscuro* in the second half of the sixteenth century? And for that time period what might be said about *repoussoir*-technique, the occurrence of *optical illusions*, *the direction of looks* or *ordinance* (in the art of Caravaggio)? Apart from this it should be possible to trace the popularity of one specific item through time or in different areas: How did chiaroscuro come into artistic practice? In which period did this expressive device become neglected? Could interesting nineteenth century examples of the use of chiaroscuro be mentioned? Very important, of course, are the obvious cohesions between items: Is there support for the supposition that the chiaroscuro may have been used to create the impression of a *short moment*, that is, like a *snapshot* of the imaginary world? Could the concept of chairoscuro be a good starting-point for discussions on the relationship between the arts of painting and music? (Somewhere Van de Waal did compare Rembrandt's chiaroscuro to the counterpoint in Bach's music.)

Apart from these obvious trails through data, a hypericonic system should be programmed to deal with questions such as: What was Rembrandt's view regarding chiaroscuro? Are Rembrandt's views about other expressive devices known? Which authors (artists, art theorists, art history writers and so on) have written about chiaroscuro and what else did they write about? How did seventeenth century authors write about chiaroscuro? (For all questions the principle of course applies that unentered information does not come out of the system.) The answer to these and similar questions ideally consists of a 'hypertext essay', an illuminatory, hermeneutic series of multiple passages of text and illustrations, put together by the reader. It is crucial, especially in a hypertext corpus, that users must be able to comment on that which they have encountered.

1.4.2 Nodes: What types of text and images?

A node is a 'chunk of information', a quantity of coherent data, which at the same time serves as a point of departure and a point of arrival in a network (*web*) of other connected points of information (17, p.105-6). Pieces of texts, pictures or parts of pictures, but also graphs, sounds, musical fragments etc. may serve as nodes in a hypertext (or hypermedia) system. Of course there is a close coherence between the nodes and links in a hypertext system. If such a system is not to become an unorganized and therefore little informative mound of rice-pudding, in which the consumer will quickly choke, then the compilers will have to make certain provisions. They may decide, for example, to only include certain *types* of nodes in the system.

If we keep the tripartite scheme of *image_-_aspect_of_image_-_text* in mind, together with the dimensions of time and space, we may for the time being globally circumscribe which types of nodes a hypericonic system should be composed of in our view. In the lowest layer of our scheme we do discern the *Illustrations* together with *Catalogue entries* belonging to these illustrations. There is no need for further comment here. The central node in the middle layer is *Item*, with as a satellite-node *Item in period.* In the top layer we should distinguish *Citations* from *Annotations*[7]. Independent from these, in the upper layer, is the node-type *Publication* which might be called a 'switch' from the new towards the old information technology (of the book). All types of nodes or 'entity types' have specific attributes. Partly on the basis of the values of these attributes may links be applied to couples or groups of nodes, viz. the type of connections which could also be fairly simply provided in conventional databases.

1.4.3 Links: What types of connections?

A *link* is the bridge between two nodes. One has to distinguish a few levels here. Firstly there is a sort of infrastructure, which consists roughly of all existent and possible links. On top of this basic structure, some more or less well described substructures may be placed (second level). By using these substructures one may organize so called *guided tours* (third level), whereas eventually the user himself will decide which specific track he will follow.

The user who departs from a certain node will generally need an idea of the place in which he or she will end up within the information system. In this context Landow speaks of a *rhetoric of departure* and a *rhetoric of arrival* (18). Just as nodes may have features or attributes so links might be typified. The compilers of a hypertext system will have to put a lot of their ingenuity into the invention of a typology of possible connections (19). This mission touches the root of every scholarly investigation. Here we will mainly look at a simple but fundamental type of connection, namely the connection between two nodes, examined as if it were an isolated case. In a later publication, currently in preparation, a more extensive typology of links will be treated.

We have seen that in Van de Waal's *Beeldleer* the nature of connections between aspects - with or without premeditation - is not pronounced. This might stimulate the thought process of the user; but it may also lead to irritative disinterestedness. Yet in the *contents* arguments

for connections may be found. A nice example of this is a card with the following note:

"Chiaroscuro is a means to strengthen the idea of a snapshot; rather than expressing smooth timelessness it emphasizes the sense of a short moment." A. Wassenbergh, discussing Rembrandts painting of Saskia [...][8].

In this context we shall interpret this passage as an argument for the linking of the items *chiaroscuro* (*clair obscure* in Dutch) and *the sense of a short moment* (*toegespitst moment*) in a specific painting. Both terms occur in the original *Beeldleer* and it is conceivable - although it is difficult to make it plausible here - that Van de Waal used such arguments for the introduction of *broader terms, narrower terms* and *related terms* in his system. Taking the above mentioned assumption as a point of departure in a hyper-*Beeldleer*, one might easily consider whether other illustrations to which the term *clair obscure* was once ascribed might just as well have been used to create the impression of a short moment.

In the quotation above one member of an art historical community indicates a connection. It is a text about the relationship between means of expression. The promise of hypericonic systems is that other members of the art historical *Argumentationsgemeinschaft* are provided with an instrument to criticize, deny, or sanction this connection. The users of a hyper-*Beeldleer* may come up with their own comments, but they can quote others just as well. Just as a modern user may challenge the opinions of his colleagues in the past, so the quoted voices from bygone ages could take up the deposited findings of a modern colleague. "To create a document or a link in hypertext is to collaborate with all those who have used it previously and will use it in the future.[...] by permitting individual documents to contribute to this electronically related overarching structure, hypertext also makes each contribution a matter of versioning. In so doing, it provides a model of scholarly work in the humanities that better records what actually takes place in such disciplines than does traditional book technology" (1, p.144).

1.4.4 Canonisation and the editorial council

The abandoning of the idea that one has to search for centrally devised structures for the effective manipulation of art historical information, structures devised by one person or only a few at best - "Van de Waal devises and fills in *Beeldleer*" - is perhaps the most important alteration as opposed to the traditional course of affairs. The coming of hypertext-corpora creates the possibility that *socially constructed* art historical information, will gain permanent presence. This trend is already becoming noticeable outside art history. According to Nielsen, "Some people like Ted Nelson expect to see the appearance of the global hypertext (e.g. Xanadu) as what has been called the *docuverse* (universe of documents)..." Subsequently Nielsen proclaims that he doesn't "...really expect this to happen completely, but we will very likely see the emergence of very large hypertexts and shared information spaces at universities and certain larger companies. [...] I would certainly expect to see the growth of shared information spaces in future hypertext systems. There are several social problems inherent in such shared spaces, however" (17, p.188). Next Nielsen pictures the foreseeable perversion of huge shared information spaces as a consequence of the addition of rubbish by malicious or blockheaded participants. This perversion already makes one worry about the quality of individual nodes, not to mention the quality of the administered trails and structures.

Crucial to the realization of our hypericonic system is thus the question of what information should or should not be assimilated in the eventual corpus. This is really the ancient problem of canonisation. Theory and practice of the invention of a hypertext *Beeldleer* emphatically unite here.

The problem of canonisation is essential for every academic discipline, but especially for scholarship in art. With respect to literature Landow discusses the problem in detail[9]. Landow states - be it with caution - that the arrival of large hypertext-corpora will lead to levelling; the indisputability of traditional literary canons - inasfar as there was talk of this at all - will eventually disappear (1, p.149-160).

We must now recognize that the canonical is in various ways problematic for a *hyperbeeldleer*. Besides the classical problem of the 'canon of masterpieces', there is also the question of a 'canon of texts about visual devices' (theoretical and practical quotations, observations, statements; historical or modern) and - most important during the building of a *hyperbeeldleer* - a 'canon of items', thus of more or less separate visual devices which deserve attention. Finally there is the question of which cohesions of nodes must be administered (= canonized).

In theory it is fairly easy to describe objective procedures in these matters. Systems might be developed in which, by means of delicate text and image-analysis techniques, the weight of the most frequently occurring visual aspects and the connections between them might be defined. In theory, the contents of complete libraries might be scanned and tackled by statistical techniques after conversion by means of OCR. The situation in practice, however, induces a more prosaic approach. The acquistion of data will for the time being be dependent upon the good will of specialists, preferably as many as possible. To counteract the perversion of the collected material some authors have proposed the institution of 'editorial councils'[10].

This idea of an editorial council we shall adopt, for as the arrival of hypertext corpora might potentially lead to an accelerated breakdown of canons - something which for that matter also applies to the more conventional databases! -, the realization, the filling of datafiles, will compel to setting priorities. Our wish actually to build a hypericonic system has led us to consider the relationship between education and scholarship.

1.4.5 The close relationship between education and scholarship

Just as Van de Waal's entire - filled - *Beeldleer* may be considered a miniature reflection, on paper, of the conventional art historical practice, so might hypericonic corpora be viewed as dynamic, electronic *models* of that practice. This makes such corpora, like *Beeldleer*, pre-eminently useful for educational purposes. Therefore it is only natural that a lot of documentation on hypertext systems is particularly about shared information spaces in educational settings[11]. Collective memory is here referred to as *course memory* (1, p.132-133, 137-141: 'Example of Collaborative Learning from Intermedia').

The legitimate influence of the teacher upon the choice of his material is, for the moment, typical in educational hypertext systems. This eases the responsibility with regard to any *Argumentationgemeinschaft*. The canonisation problem may thus be temporarily bypassed ('the master disposes'). Apart from this practical argument there are some autonomous educational reasons to give priority to the development of courseware in hypertext form too. Images and texts may always be related to one another and relevant material may be retrieved with much greater speed than was possible by means of conventional media; not only by the student in a computer lab, but also, if the necessary network configuration is at hand, by the professor whilst lecturing. The user of the system has at his disposal stimulating choice options, possibilities which may lead to research in depth or, on the other hand, a superficial investigation of global lines. In the meantime the possibility remains of stipulating specific 'paths' through the information space, tagging in this way some required course material. Besides all this, a good hypertext authorial system gives the professor an opportunity to register the routes covered by individual students. The material is easily adaptable and expandable. That is only natural, and the amassed information which students and academic teachers have collected in previous courses may always be reused by other students and educators[12].

Some benefits with regard to the *quality* of hypertext data-manipulation should also be mentioned. The user may concentrate on the works of art functioning as *nodes* in a hypermedia network individually. In this manner the links to diverse texts or other works of art are used for object-oriented education or scholarship. This is research of the *specific* ('centripetal methodology', in the words of Van de Waal). Similarily the *links* between all sorts of nodes, and therefore the *generic*, might be given full attention ('centrifugal methodology'). In other words, a hypertext system facilitates the study of both work *and* context.

The hypertext concept with regard to the time dimension has similar potential. Links which connect works of art and theories of art in a particular period will facilitate transversal studies, whereas the links which are 'parallel to the timeline' make it possible to do longitudinal research. Finally we should mention the possible support of interdisciplinary studies. We do not discern any objections in principle against an art historian who is tracing texts on the psychology of perception, when he is professionally interested in phenomena such as symmetry, the effect of contours, *horror vacui*, completeness, etc.

Thus the nature of computer assisted education will thoroughly change; the conventional notion - student-asks-computer-answers-etc. - no longer applies. The computer may become a supportive instrument in a dynamic system of knowledge exchange. The central information-base may be used to tread pre-programmed paths, but could also function as a forum where information seekers and those offering information will cross paths, a place where every user may add or extract information and review what others have accomplished.

An additional practical advantage compared to more conventional methods of computer assisted education is that it is no longer necessary to contrive the student's entire train of thought beforehand. This will economize preparation time in courseware development. The student, on the other hand, will gain insight in the construction and evolution of art historical information. If the project is carefully treated, course memory may seamlessly pass over into the collective memory of a true *Argumentationsgemeinschaft*. In other words, *hypertext corpora will narrow the gap between education and scholarly research.*

2. Practical Hypericonics in Education and Scholarly Research

2.1 General requirements

A 'reduced electronic *Beeldleer*' might eventually develop into a useful object in two different ways: within an educational context it could become an interactive hypermedia learning environment, concerning the elementary means of expression; in the area of scholarship we foresee that it will evolve into a hermeneutic instrument, a *mnemotechnic aid* in exploring meaning in the visual arts. For both versions of our hypericonic system some general facilities are necessary. First of all we should mention the usual hypertext provisions such as: various types of nodes, various types of links, backtracking and overview screens, protection of information at multiple levels, non-screen-dependent anchoring of links etc. Apart from all this it is necessary that the users are enabled to choose for navigation through a subset of all present nodes, possibly *via* a subset of all present links. Registration of trails must be possible, with precise registration of the elapse of time during navigation. Furthermore, as was stated earlier, authorized users should be permitted to introduce new links and/or nodes *during the reading session.* To avoid making the work of an editorial board unnecessarily complicated, registration of last updates at node and link levels is desired. Needless to say, it must be possible to approach the entire hypertext corpus by means of a computer network.

2.2.1 Discussion of a Hypericonic Educational System

Between September and December 1992 gathering of source-material began for a hypericonic educational system. On the basis of this material *typical connections* between entity types will be formulated. We decided to employ Van de Waal's original *Beeldleer* as something to fix our mind for the time being. A group of about ten doctoral students at the Department of Art History of Leiden University are currently working on the project, which will be continued in 1993.

The material collected by the students was entered into a shared information space on a central computer. The resultant and growing hypericonic file may be approached and updated by all who are authorized, by means of PC's connected to the network. During this test phase the cryptic and somewhat outdated textdatabase-management system *askSam* is in use as a prototyping program. A hard-core user of *askSam* may very pointedly search through large text-datafiles. For the novice, however, the program is less accessible. *AskSam* has substantial programming possibilities and posseses an elementary facility to display pictures. However, a great disadvantage of the program is that it can only symbolically - by means of word correspondences - establish hypertext links. The same is true for trails through the information web, meaning that somewhere a card must be stored with the nodes that are available at a certain time. Hierarchical relations are indicated on the map by means of the traditional method of indentation.

In the near future *askSam* should therefore be exchanged for a true hypertext system such as *Hyperwriter, Guide, Toolbook, HyperCard, Microcosm* or *Intermedia.* The criterion which will turn the scale in the final choice will be that the ultimate program must be able to manage an *open information space*; a program, in other words, which continuously offers specialists and non-specialists alike the opportunity to add material to the corpus (as for example *Intermedia* does).

In our project each student initially chose one topic from the entire collection of *Beeldleer* items. The advice hereby was to choose in particular means of expression which are 'demonstrable' and therefore able to be illustrated in the entity type *Illustrations*[13], for example *contour, horror vacui, static shape, chiaroscuro, direction, chance images, unfinished forms* etc. The first assignment was to collect materials concerning the chosen item, in such a way that it would, in principle, be possible to write a simple iconological history of the item using this material. In this phase of the experimental project isolated means of expression therefore form the starting-point. In later data aquisition other procedures may be followed: describing works of art in terms of the means of expression which are used; distilling pithy pronouncements from art historical/-theoretical classics; collecting conceptions of artists about art etc. Students are free to choose the necessary sources themselves. They do however, receive some guidelines.

In the preparatory stage of the project Van de Waal's entire *Beeldleer*-classification scheme was digitized, i.e. provided with an index of all 600 terms which occur in the system. For the time being six introductory templates were made, agreeing with the types of nodes as described in section 1.4.2. The following is a brief discussion of the used templates.

- Each *Item* is characterized as follows: What is the term? What are the (widely used) translations of the term? How can the item be (briefly) defined? How can it be described more extensively using encyclopedic information? Are the means of expression period-dependent? What are - according to Van de Waal - broader, narrower, related and associated terms? Which sources have been consulted for the description of the item?
- Nodes of the type *Paragraph* are, in a certain way, extensions of the free text field with more extensive descriptions in the node *Item*. The nodes are designed to write a paragraph from the 'history of artistic notions'. Apart from a field with free text there is room for a reference to the discussed item and a period indication. Extensive general comments about the item can also be made here.
- The node type *Illustration* contains basic registration information about works of art (name of artist, title, dating, period, and whereabouts), in addition to a small field to record the items which have been connected to it. For the time being, the provider of material on this map may provide argumentation for the proposed joining of illustration and *Beeldleer* items. In the catalogue information of a self-portrait of Odilon Redon (1888) in the Municipal Museum of the Hague a quotation of J.L. Locher has been included as an 'argument':

"Not only as a close up, but also in the way in which Redon's face is partly cut off on the picture surface, this portrait drawing anticipates much later experiments in portrait photography..."[14]

This argument therefore supports the connection of items
- *close-up* and *abrupt cut off* - and illustration, as well as the mutual connection of the two items!
- The classification of the *Citation* and *Literature* nodes speaks more or less for itself. The references to literature have been standardized, in which the field 'term' can be filled with multiple *Beeldleer* terms. The basicelementof the quotation template is a free text field. Here too a field called 'period' has been incorporated, so that one can select chronologically comments about art from certain periods.
- The last substantial template is *Annotation* with which the individual user is able to relate a marginal note to each node of the hypertext.

Three of the six introductory templates are in the present set-up meant to be filled with one's own contributions; these are the nodes of the types *Item, Paragraph* and *Annotation.* Three other types of nodes seem particularly

suitable for the classification of ready-made 'found' material. There have been consistent attempts, where necessary, to record for each note - in a separate field called *source* - the place from which the collected information has been borrowed[15]. Finally, a field has been placed by each node in which the providers of material can make themself known by means of date, initials, and number, for example: *19.11.92 GN-32*. In this way it is always possible to isolate the nodes added by a certain person. When entering data one chooses one of the prefabricated templates before beginning to work.

The links between the various nodes in this hypericonic educational system are especially *argumented links*. There are continuous arguments for the jumps from one point to another in the hypericonic space. Further study must point out whether a fundamental typology of links, starting with the collected arguments, can be stipulated. In most of the presently used node types (*Paragraph, Citation* etc.) an extra field can be imagined in which such an indication of type has been fixed, for example, 'general formulation', 'example', 'philosophical discussion', 'interpretive discussion', or even 'poetic digression' (19).

In developing a hypericonic educational system the ideal is to create an environment in which the users will find themself in the virtual presence of others, of voices living and deceased.

2.2.2 A Hypericonic Research System

Apart from the practical realization of our hypericonic educational system, initiatives will gradually be unfolded which will prepare for the development of a program for scholarly research. The efforts on an organizational level will, amongst others, consist of finding a suitable form for the functioning of the editorial council. Furthermore, additional requirements must be set for the software to be used. Using actual knowledge about the design of hypertext systems, a typology of 'linking strategies' will be developed. Linking strategies may be based upon on the perceptions of the human observer. An alternative might well be links that are based upon mechanical distinctions. Two separate dissertations on both lines of research are currently in preparation.

The ideal in developing a hypericonic research system is to arrive at an application which enables the individual user to extract information from a corpus of works of art and texts when doing personal research. It must then be possible to add to this corpus following personal motives.

3. Epilogue: The Ethics of a Heavily Implemented Art of Memory

The project which we have unfolded here, was triggered by the desire to do something about a general human problem. In the literature we found two passages indicating this problem in a surprisingly similar way. One quotation dates from 1974, when the German art historian Otto K. Werckmeister stated: *"For the past 160 years the academic discipline of art history has worked at reproducing the enormous amounts of works of art from all places and times and explain them historically. Today, due to its expansion this scholarship can no longer bring any fundamental [new] insights into art. Understanding of art appears only to be possible as an extensive knowing and this knowledge, instead of lying in far away, unknown objects, is hidden from individual refelction behind the endless walls of books of libraries. An objectified experience is again becoming unknown"*[16].

Our second quotation is dated a thirty years earlier. Here too a stifling information overload is characterized: *"There is a growing mountain of research. But there is increased evidence that we are being bogged down today as specialization extends. The investigator is staggered by the findings and conclusions of thousands of other workers - conclusions which he cannot find time to grasp, much less to remember, as they appear. Yet specialization becomes increasingly necessary for progress, and the effort to bridge between disciplines is correspondingly superficial. Professionally our methods of transmitting and reviewing the results of research are generations old and by now are totally inadequate for their purpose. [...] The summation of human experience is being expanded at a prodigious rate, and the means we use for threading through the consequent maze to the momentarily important item is the same as was used in the days of square-rigged ships. [...] There may be millions of fine thoughts, and the account of the experience on which they are based, all encased within stone walls of acceptable architectural form; but if the scholar can get at only one a week by dilligent search, his syntheses are not likely to keep up with the current scene"* (24).

This last quotation is cited from an epoch-making text by Vannevar Bush, the scientist who, shortly after World War II, planned to build his so-called *memory extender* 'Memex'. This initiative has made Bush the spiritual father of all present (and future) hypertext systems. Werckmeister, as an art historian, established what are the consequences of a 'knowledge overload' within *his* discipline; Bush established what is going on in the human acquisition of knowledge in a more general way and he tried to formulate a practicable solution to these problems.

Memex eventually led to hypertext, and hypertext, as we have seen, may lead to a 'society of text' (and *images*), to a 'social construction of information'. The general question we posed in this article is: could the hypertext concept be used to raise a platform, a platform on which we may permanently hear the voices of an *Argumentationsgemeinschaft* of art historians? Today such a platform seems indeed to be possible. But its foundation definitely has some questionable aspects. It does, in any case, not lead to a less extensive knowledge *extensives Wissen*, even though knowledge will be available and transferable right away. What will eventually happen to the personal mind, under the influence of these developments, is uncertain. Particularly in the Humanities this is

a heavy-weighing uncertainty. Nielsen, for example, pointed out that frequent users of hypertext systems might somehow be troubled by a fragmented world view as a result of their endless frog leaps from node to node (17, p.190). This seems to be a convenient moment to return to the classical objections against the art of memory (*Ars Memoriae*). The classical art of memory aimed at improving artificially the memory of the *individual* orator in order to manipulate a crowd of auditors. In the social construction of information with the aid of hypertext or hypermedia systems, the memory of an entire *Argumentationsgemeinschaft* is artificially improved. This may proceed in such a way that this extended memory becomes immediately available for each separate individual. In what way this may influence the whole human condition is an open question. But the supposition is strong that the above mentioned project will raise discussions about the theories and methodology of art history, as well as the reflection on a future in which the large-scale publication of the world, the ubiquity of art and commentaries upon art, and the unheard-of expansion of the human memory are will become more and more typical. The project of a Hypericonic System is therefore a full-fledged academic undertaking.

Notes

1 Joan L.Kirsch and Russell A.Kirsch have written several articles about this possible area of research, for example (10). Some other examples are (11) and (12).

2 Some of the other artists and art theorists who proposed more or less coherent arrangements of basic means of expression are Dürer, Malevitch, Klee, Kandinsky and other Bauhaus teachers. Furthermore one can encounter systematic descriptions of elementary artistic means in publications by amongst other René Berger, Heinrich Lützeler, Oskar Bätschmann and Irwin Panofsky. Apart from these, all sorts of unpretentious arrangements are locally in use at many art academies.

3 *Kaartsysteem 'Beldleer'*, typed and handwritten manuscript, part of the inheritance of Henri van de Waal (Leiden, 1972).

4 J.L.Locher; Interview d.d. Friday 6th November 1992.

5 See (1) for further discussions on the subject. Another book with clarifying discussions on hypertext is (17).

6 The term *iconics* is somewhat doubtfully adapted from Max Imdahl in (13, p.97): "Während aber Ikonographie und Ikonologie dasjenige aus den Bildern erschliessen, was ihnen als Wissensinhalte vorgegeben ist, was vom Beschauer gewut werden muß und sich durch Wissensvermittlung mitteilen läßt, sucht die Ikonik eine Erkenntnis in den Blick zu rücken, die ausschlieelich dem Medium des Bildes zugehört und grundsätzlich nur dort zu gewinnen ist... Die Ikonik sucht zu zeigen, daß das Bild die ihm historisch vorgegebenen und in es eingegangenen Wissensgüter exponiert in der Überzeugungskraft einer unmittelbar anschaulichen, das heißt ästhetischen Evidenz, die weder durch blosse Wissensvermittlung historischer Umstände noch durch irgendwelche (fiktiven) Rückversetzungen in diese historischen Umstände einzuholen ist".

7 The 'cards' labelled *Citation* and *Annotation* here, actually belong toone and the same type of card, viz. *Commentary*. In the final system this should be adequately implemented.

8 "Het clair obscure is een middel om de momentopname te versterken, dug niet het egale tijdloze, maar het toegespitste moment". A.Wassenbergh, in: 120 Verslag v.h.Friesch Gen. (1948), p.14, over Rt.Saskia (Annotation of Henri van de Waal on a *Beeldleer*-card categorized 42.21.3.)

9 For an elaborate discussion of these issues in the field of art history, see (20).

10 Cf. (17, p.189): "A likely development to reduce these problems will be the establishment of hypertext 'journals' consisting of 'official' nodes and links that have been recommended by some trusted set of editors. This approach is of course exactly the way paper publishing has always been structured".

11 Cf. (17, p.188): "Already we are seeing small shared information spaces in teaching applications of Intermedia, but they are restricted to the students taking a single class. In the future we might expect students at large numbers of universities to be connected together".

12 An extensive discussion can be found in (1). For an interesting example application see e.g. (21).

13 These are especially to be found in the categories 3 (Form) and 4 (Space) of the original Beeldleer system.

14 "Niet alleen als 'close-up' maar ook door de wijze waarop Redons gezicht gedeeltelijk afgesneden in het beeldvlak staat, loopt dit getekende portret vooruit op pas veel later komende experimentele fotoportretten..." (22).

15 For a concise discussion of copyright problems see the section entitled 'Access to the Text and the Author's Right (Copyright)' in (1, p.196-201).

16 "Seit hundertsechzig Jahren ist in der akademischen Disziplin Kunstgeschichte daran gearbeitet worden, die unermeßliche Menge von Kunstwerken aus allen Orten und Zeiten zu reproduzieren und historisch zu erklären. Heute kann diese Wissenschaft infolge ihrer eigenen Expansion dem Bewußtsein keine grundsätzlichen Erkenntnisse über Kunst mehr vermitteln. Kunstverständnis scheint nur noch als ein extensives Wissen möglich, und dieses Wissen ist, statt in fernen und unbekannten Objekten, hinter den endlosen Bücherwänden der Bibliotheken dem einzelnen Denken entzogen. Die objektivierte Erfahrung wird wieder unbekannt" (23, p.64).

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