Art of Drawing
(towards Technology of Art)

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To Jiří Načeradský on the occasion of his 60ies birthday.

Abstract. This is an extended summary of an invited talk given by the author at Graph Drawing 1999. The text contains some of the basic ideas together with an outline of the whole lecture. As an appendix we included Nešetřil – Načeradský 1995 Manifesto.
This paper does not contain any of the extensive illustrations which accompanied the lecture (of course this is a paradox in itself: a paper on drawing without drawings). This is necessary due to the format of these proceedings. Moreover the lecture was conceived as a multimedia show (with slides, CD projection and transparencies accompanying the lecture on three different screens) and this is hard in any case to reproduce in the print form.
Thus, with a single exception, there are no accompanying figures here. For the benefit of the reader we included the list of our exhibition and an interested reader can get more complete information from the preprint KAM-DIMATIA (under preparation).
One can also consult the two-volume set [11] and related works of the author [8], [9] and [5] (and references given there). This text was prepared especially for the conference on Graph Drawing.

1 Introduction

This text is based on an invited talk given by the author at GD'99. The text contains some of the basic ideas together with outline of the whole lecture.

This lecture was conceived as a multimedia show with slides, transparencies and CD projection (thanks to Hubert de Fraysseix) accompanying the lecture on three different screens called: Samples, Stories and Souvenirs.

All the illustrations on Samples and Souvenirs were related to ongoing artistic collaboration of Jiří Načeradský and the author. Jiří Načeradský (born 1939) is the foremost Czech artist who distinguished himself very early (e.g. new figuration) in the sixties and after 1989 was a professor at both the Academies of Art in Prague and Brno. He is represented in many major public and private collections locally and abroad.

Our collaboration started more than 10 years ago and developed from discussions and exchanges of ideas to joint projects and to actual collaboration on canvases and other media (which we sign jointly). Our list of exhibitions includes: VIA Art , Prague 1995, House of Arts, České Budějovice, 1997, Karolinum and Malostranská beseda, Prague, 1998, Rabasova Galerie, Rakovník 1998-9.

In this paper we want to give an overview of the verbal part of the lecture (as projected on Stories) together with some of the basic ideas together with an outline of the whole lecture. However this paper does not contain any of the extensive illustrations which accompanied the lecture. To preserve at least some of the authenticity we continue this text in 'Ich form'. Some comments about missing illustrations are in [ ]-brackets.

2 Drawing and Sketching

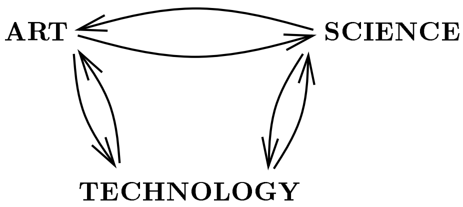
This is a volume on Graph Drawing. Thus I felt that it is perhaps fitting to speak about art here, and I accepted the invitation of the organizers. Graph Drawing is an area with Kandinski algorithms and even a Gioto algorithm (in both cases just a coincidence and a 'poetic' terminology). Perhaps more importantly this area involves aesthetic criteria which are explicitly discussed (also in several papers in this volume). It is my conviction that matters which we are going to touch upon are deep and profound. To reformulate the words of Kandinsky [6] (which he used when comparing art and music):

> In our opinion the similarities of Art and Mathematics are evident but they lie very deep.

I also like the opening lines of the scholarly work of H. Damisch [1] where he motivated his work with:

> Unpatience how the problems of perspective are treated without a deeper philosophical context.

2.1 The basic scheme



This scheme has the following features which I elaborated in the talk:

historical numerous evidence for the existence of all arrows from early history;
contemporary think of contemporary *international style* of installations and media related action art so well documented by 1999 Bienale di Venezia;

key words these include: methodology, honesty, drive for new, respect to the tradition,... versus freedom, aesthetic, public attention, market influence,...

In the lecture I illustrated mostly the relevance of the following arrows:

$$\text{ART} \longrightarrow \text{SCIENCE}$$
$$\text{ART} \longrightarrow \text{TECHNOLOGY}$$
$$\text{SCIENCE} \longrightarrow \text{ART}$$

Here I concentrate on the first interaction item only.

Where do we see the best evidence of these interactions, of such contacts?

As expected this is best documented on the remarks on frontiers of these activities, somewhere on the boundaries. Thus for the majority of my talk I decided to speak about sketches and about sketching as a typical drawing activity. I believe this is directly linked to some of the central problems of Graph Drawing.

2.2 Defining Sketches

Sketches are not related just to drawings. They are not restricted to the particular material used. Remember the great sketches of Rubens in oil (e.g. in Munich, in Prague) or sketches of sculptures which are necessary for major projects (DIMATIA houses a beautiful bronze statue - sketch of Charles IV for historical aula of Charles University by Jan Pokorný, 1947).

[I gave here further numerous examples, old and new.]

What then are sketches?

I believe they are defined by the *action* and not media, by their *context* and intended *purpose* (of their creation).

The action is usually fast and frankly mirrors experience and underlying skills; the context is usually important and meaningful and often leads to some of the key works of artists (and as a consequence many 'unrelated' sketches are destroyed as 'meaningless'); and the purpose is as important as the context – sketches serve to free imagination, to test the unknown ground, to prepare and to organize thoughts and forms in relation to future projects.

I think in this sense one can consider sketches as *eternal anticipation* of action and conceptual art, or as a privatissimo of both, as a daring individual action in a world restricted by concepts, traditions and trends.

[This I documented thoroughly in the lecture.]

2.3 Nature of Sketches

The action- and conceptual- definition of sketches is not the only possibility. Another is their *freeness* and *gesture* which reflects and anticipates the mind, abilities, dreams.

They seem to be *encodings of fantasy.*

This striking freedom is surprising but it can be explained as a combination of several factors. I listed and documented several such aspects which make this freedom possible

contextual they are kind of privatissimo;
technological easy means to master;
physiological easily controllable small movements as opposed to large formats;
randomness unconsciousness, modern 'blow up' effect.

Yet these are just some side factors of some masterpieces which one can compare to little jewels (of mind and skill).

What a sovereignty and grandeur, what a style!

[Here were more examples spanning six centuries.]

The sketches also reveal very frankly the talent and the degree to which a particular artist had to *learn* the skills. Some seem to have a gift from God himself (say Raphael, Rembrant, Goya, Picasso; we all know). Even if we study their early, even very early and childish, works we seem to find no formal mistakes. But perhaps one should not use the term mistake. M. Mendés France (inspired by Erik Dietman) questions whether artists can make mistakes at all, [11], Vol.I.

Many can learn and, e.g. the 19th century was full of gifted and informed 'amateurs' who complemented their activity (e.g. traveling) and profession by sketching.

[Here I included several examples: H. C. Andersen, Ch. Baudelaire, M. Proust, J. W. Goethe, V. Hugo, and showed also some less known (contemporary) 'amateurs'.]

Times are changing, less training and less desire in the age of 'instant picture taking' leaves us perhaps with pictograms (and souvenir photography) and even with graph-drawing as the modern equivalent of some of these old-fashioned skills.

What a chance for Graph Drawing!

2.4 Eternal Style and Quality

It is perhaps surprising to what degree the quality of those sketches didn't change over time. In the same way as Shakespeare and even Greek drama and poetry seem to be forever focused on the actual themata, the sketches show a surprising robustness and unity of style over the ages. Perhaps it is due to the fact that a sketch is often a direct witness of the latent mental power, of the artistic tendency of an artist,

One can only speculate to which degree the prehistoric stone drawings and the Etruscan heads belong to the category of sketches. But perhaps the extent to which these works are directly bounded to the mental processes and the destiny of individuals influenced their acceptance by modernists early in this century (which then started their popularity).

But sometimes we do not have to speculate and we can document and prove these claims.

To be more specific I want to illustrate this with the sketches of Magister Theodoricus – one of the masters of the international Gothic. Theodoricus was the court painter of Charles IV and he decorated his newly built castle Karlštejn (approx. 35 km west of Prague) during the period 1350-80. The most precious room in this castle, the Holy Cross Chapel, (constructed under influence of Sainte Chapelle in Paris) is decorated by 129 large format paintings on wood panels. These pictures represent portraits of saints and as a whole represent one of the largest collections of its type. (See [12] for a scholarly description of the work and historical context of Magister Theodoricus.)

Under these panels one finds plastered wall with a few preserved sketches by Theodoricus and his workshop. These sketches probably helped to design the complex setting of the chapel and possibly aided in the right positioning of portraits of saints (how much different from today's CAD praxis).

But the comparison of these sketches – wall drawings and final works is really striking. While the final wooden panels are beautiful examples of art of its time (international Gothic, i.e. icon - type painting, rigid, with golden highly decorated background, and with strikingly realistic faces) the sketches are surprisingly modern and some seem to share the style and qualities of a Renaissance drawings.

This is not a singularity and it can be observed elsewhere. Many old sketches look strikingly 'modern'. On the other hand many modern sketches resemble old times. It is as if the times were not changing (for sketches).

2.5 Rarity and Inaccessibility

Sketches are difficult to see. Artists consider sketches their private diaries and consequently do not want to part with them, they are guarded authors secrets. Thus in turn they are valuable collectibles and only few have reached facsimiled, not to mention accessible, editions.

[Here I gave examples of Delacroix, Tichý, Cézanne and Gauss sketchbooks.]

Public collections do not usually show sketches because of their fragility. So we have to rely on reproductions and rare (usually thematic) exhibitions. And this goes hand in hand with the effectiveness of sketching: just a few lines (of Matisse or Picasso, of course, but count how many lines are used in some of the beautiful realistic drawings of Rembrandt) which make a distinction!

A good drawing or a good sketch is a jewel. So should be its technological counterpart. This calls for a hierarchical *classifications* of drawing devices and programs. Art is not an area very remote from Algorithm Design. This fits to our *Creative Thesis* (see [8], [9]; for supporting evidence see e.g. [7]). But this gnoseological reason has to be deepened and complemented so that it will permit an action (transformed in modern terms to algorithms).

3 Summary (of the first part of the lecture)

Sketches, in their technological simplicity and predominantly line character, stand perhaps closest to graph drawing. Linear drawing is the main domain of sketches (despite of the versatility and broadness of this artistic category).

The Art of Sketches has been developing for centuries and their Style shows a surprising tranquility. The discoveries in this area seem to have stellar qualities and seem to have the character of fundamental discoveries. Probably this is caused by the fact that sketches are so closely related to our perception and mental processes.

I believe this calls for new investigations of these techniques and new approaches to classical branches of art history so that these achievements can be applied to modern technology, computer graphics and, last but not least, graph drawing.

And also recall that people mostly enjoy and value sketches and they believe that they understand them (as opposed to the large part of modern technology).

I believe this calls for

Analysis of the Technology of Artistic Perception

Analysis of Sketches (more generally of Artistic Works) from the point of view of Visual (Technological) Function

Computer generated art addresses some of these phaenomena but these questions call for thorough and scientifically exact investigations guided by the hope that it will be possible to apply the quantified results to technology (Artificial Intelligence and, also, Graph Drawing).

Instead of postmodern archaeology of modern art ([3]) we need *technology of art* and of artistic processes in general.

In the same vein Artificial Intelligence should capture *technology of knowledge* as opposed to archaeology of knowledge (Foucault, [4]).

It is my feeling that all modernism gets its fulfillment in Artificial Intelligence. AI should inspire *technology* of intelligence, technology of knowledge. Kosuth ([7] goes in the right direction and is interesting (but as was realized early unfortunately it is full of loopholes).

Algorithms for graphical outputs should take into account quantifications and the underlying structural essence of highly successful drawing activities – sketching, drawing techniques (and, yes, their visual and mental tricks) developed during the long history of their development.

And even if such quantification would appear impossible to achieve (by present means) it should provide some criteria for perception of technological principles of art and allow to find algorithms for satisfactory drawings. The goal may be not to lay down rules but to show what to look for and what to achieve. I started to pursue these questions at both ends of the spectrum – artistic as well as algorithmic.

Due to the flexibility and qualities of graphic outputs of computers perhaps in the future art can influence technology directly – perhaps for the first time in history. Since Marcel Duchamp we are already prepared by *freedom of indifference*, [2]. We have to approach Graph Drawing with the indifference reserved for Readymades. But the analysis has to be deeper, the indifference greater as we want to construct, to produce, to repeat. Thus technology, i.e. *technology of art*.

We need art (theory) without aesthetic, which will perhaps lead to aesthetic without art (i.e. technology of artistic perception).

Of course matters are not simple (as they never were) but we have to try.

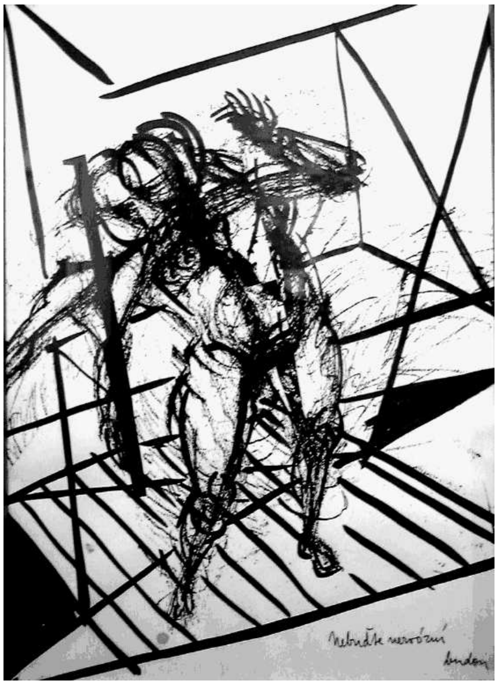
[For elaboration of these rather sketchy lines see [10].]

[There are many more applications of Science to Art. These are presently often misunderstood, even misused (e.g. recently fractals or complexity) but they are more frequent. This was elaborated in the second part of my lecture, see [10] and [11].]

4 Appendix

On the occasion of two 1998 Prague exhibitions and a two - part exhibition in Rakovník (December 1998-March 1999) a two volume catalogue *Anthropogeometry I, II* was published by Rabasova Gallery, [11]. The Volume I contains texts related to the work of authors (contributions by prominent Czech art-historians I. Neuman, E. Petrová, B. Jiráčková, M. Nešlehová), and texts related to the problems of art and science in general (contributions by H. Damisch, M. Mendès France and J. Nešetřil). The Volume II contains reproductions of some of our works divided in four parts (I. Large Formats, II. Stories, III. Geometry, IV. Sketches and Miniatures) approx. 90 reproductions in total.

The volumes also contain the following text which became known as a 'manifesto'.



Nešetřil and Načeradský 1995 Manifesto

The relationships between scientific fields and art trends are becoming increasingly topical, possibly as a result of general uncertainty, a lack of aims and the fragmented nature of people's experiences. This is perhaps (paradoxically) why many artists try to arrange and formulate the principles of their work in a more precise manner, for instance by logical means. On the other hand, scientists and mathematicians in particular like to emphasize the intuitive and aesthetic features of their work, something that can be seen in many meetings, partial formulations, seminars and texts. Our current work is different. We confirmed the usefulness of our contacts during our earlier collaboration (Ateliér 1993, Galerie Artforum 1992, Galerie Na Bidýlku 1995). What we are now concerned with is the attempt at a new form of depiction, a new way of seeing, a different pictorial construction that will enable the capturing the world of doubts, one of fragmentary experiences and confusion of visual information. We are looking for construction and method. We feel an affinity towards Poussin's struggle, as well as towards the complex designs of Raphael and Rubens which encourage us and confirm that we are attempting the possible. We feel a great affinity towards the struggle of the Cubists and Futurists, who are our 'fathers' although we are going elsewhere. We found partial confirmation of our techniques and methods in the lines of Braque that had previously remained a mystery. This was very important! We follow contemporary geometry in all its fields. Encouragement is to be found even here! Its bold constructions give us courage. We try to return to painting its fundamental and eternal problem - the problem of depiction and above all the depiction of space. We don't sense a crisis, only a limitation of our own energy and ability. We are not theoretists, but workers on a construction site. There is nothing more to reveal at this point.

(First published by Galerie VIA Art, 1995, translated by R. Drury.)

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