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AUTHORS

Prof. dr. G. VERSCHAFFEL. Universiteit Gent, vakgroep Architectuur en Stedenbouw, Jozef Plateaustraat 22, B-9000 Gent, België.

Prof. dr. A. VAN DER WOUD. Rijksuniversiteit Groningen, faculteit Letteren, Instituut voor Kunst- en Architectuurgeschiedenis, Oude Boteringestraat 34, NL-9712 GK Groningen, Nederland.

Prof. dr. R. RUBENS. Universiteit Gent, polikliniek Endocrinologie, Universitair Ziekenhuis, 185 De Pintelaan, 9000 Gent, België.

Dr. J. MATTELAER. Uroloog. Albijn van den Abeelelaan 12, B-8500 Kortrijk, België.

Prof. dr. Marc SPOELDERS. Universiteit Gent, faculteit Psychologie en Pedagogische Wetenschappen, vakgroep Pedagogiek, Henri Dunantlaan 2, B-9000 Gent, België.

Prof. em. dr. J.A.M. CARPAY. Lindenlaan 17, NL-3471 CV Kamerik, Nederland.

Prof. dr. P. SIMOENS. Universiteit Gent, faculteit Diergeneeskunde, vakgroep Morfologie, Salisburylaan 133, B-9820 Merelbeke, België.

Prof. em. dr. B. VOLLMERHAUS. Greimelstrasse 22, D-85737 Ismaning, Deutschland.

Prof. dr. D. HEIRBAUT. Universiteit Gent, faculteit Rechtsgeleerdheid, vakgroep Grondslagen der Geschiedenis van het Recht, 4 Universiteitstraat, B-9000 Gent, België.

Prof. dr. D. TAMM. Universiteit Copenhagen, Law Faculty, Research Section 1, Studiestraede 6, DK1455 København K, Denmark.

Prof. dr. G. LAUREYS. Universiteit Gent, faculteit Letteren en Wijsbegeerte, vakgroep Scandinavistiek en Noord-Europakunde, Rozier 44, B-9000 Gent, België.

Prof. dr. F. GREGERSEN. Gammel Kongevej 142, 2th, DK-1850 Frederiksberg C, Copenhagen, Denmark.

GEORGE SARTON CHAIR

of the

HISTORY OF SCIENCES

2004-2005

SARTON CHAIR LECTURE

Laudatio Auke VAN DER WOUD

Bart Verschaffel

Prof. Dr Auke Van der Woud is an art historian and presently professor in the history of architecture and urban development at Rijksuniversiteit Groningen. He was a curator and later a deputy director at the Kröller-Müller Museum in Otterlo (until 1981); he taught architecture history at Rijksuniversiteit Groningen, and, after his promotion in 1987, he became professor of the history of architecture at Vrije Universiteit Amsterdam, a position he held until 2002.

After publishing a number of art-historical studies as a young scholar and curator, Auke Van der Woud wrote a few studies of extraordinary interest on the subject of the history of urban development and the landscape. They include *Het Lege Land. De ruimtelijke orde van Nederland 1798-1848,* Amsterdam 1987 (fourth edition in 1998), 687 p. – a publication based on his doctoral dissertation – a study in which he emphasises the importance of landscape study for the history of urban planning and architecture; *Waarheid en Karakter. Het debat over de bouwkunst 1840-1900*, Rotterdam 1997, 483 p.; published in English as *The Art of Building: From Classicism to Modernity. The Dutch Architectural Debate 1840-1900,* that testifies to the author's interest in and knowledge of Dutch architecture and architectural philosophy of the 19th century; *De Bataafse hut. Denken over het oudste Nederland (1750-1850),* Amsterdam 1998, 222 p. (an adaptation of a book from 1990, entitled *De Bataafse hut. Verschuivingen in het beeld van de geschiedenis 1750-1850)*; and an architectural monograph on the Dutch architect Wim Quist in 1989.

The published research of Auke Van der Woud covers the history of architecture and urban development in the period 1850-1940. Since 2001, Van der Woud has been working on an extensive project, a sequel to *Het Lege Land*, on the subject of the transformation of the cities, towns, and countryside of the Netherlands between 1850 and 1900.

It is difficult to pick the most important of these publications. However, one work in particular that is both surprising and extremely

interesting is 'De Bataafse hut. Denken over het oudste Nederland', in which Van der Woud examines how the Dutch themselves thought about their own earliest history in the 18th and the first half of the 19th century: the history of the Batavians in the Netherlands. In the daringly personal concluding part on 'historical consciousness', Van der Woud writes that "the value of explanations is relative and they often have a negative effect, because they lock our thinking into existing concepts". The book he has written "is really one long demonstration of the fact that explanations function as part of a particular social or scientific convention. Such a convention makes for coherence; it integrates; and it makes no difference whether the accepted authority is the Bible or recent specialist literature." Consequently, writes Van der Woud, "I am more interested in the riddles, not looking for solutions, and certainly not for explanations".

In those words, I believe, Van der Woud sets out the fundamental intellectual attitude he has maintained to this day, and at the same time, points to the importance of the discipline of the historiography of science for thinking and culture in general. Philosophy of science does not have a monopoly on the critical evaluation of explanatory models. Simply following the history of different 'explanations', approaching them as a history, already yields a relatively 'exterior' point of view: one that does not 'know better', that is not superior, but, instead, that puts the overly simplistic idea of scientific work as a process of accumulation and progress – as if, with every scientific discovery and insight, we are getting things increasingly 'right' – into its proper perspective. Certain kinds of science naturally seek explanations – and therefore conclusions, which comes down to consensus – but the reflection on that science, be it philosophical or historical, is under no such obligation. I quote Van der Woud: "Explaining is a habit from the old reality, an academic ritual that stems from the 18th-century obligation to demonstrate philosophical connections. Let us face the fact that our age no longer needs the help of such academic customs. It is sufficient that we see the new reality emerge, and observe this process as sharply and as clearly as possible, without seeking to judge or explain." This invitation to 'look calmly' at the world and the pursuits of man – to think, describe, and formulate with accuracy, and to seek the right words for it – is simultaneously the expression of the intellectual ethics advocated by Van der Woud: the humble detachment of the historian, combined with an eye for 'beauty', a

beauty that is not so much aesthetic as it is intellectual, a beauty that is found in the lives and actions of people, and revealed when it is captured, named, and preserved in words, images, and forms.

EXACT CIVILISATION. THE EMERGENCE OF A TECHNOLOGICAL CULTURE, 1850-1900

Auke van der Woud

'Technological civilisation' is a conjunction that raises questions. We use it more or less thoughtlessly for peoples from ancient times. The Incas and the Romans, for instance, had a technological civilisation. We would not apply the term to our own society quite as easily. Not only because the word 'civilisation' has become somewhat obsolete these days, but also because we seem to feel that a civilisation that is designated as 'technological' is lacking in some way or other. In general, there is some resistance to the idea that technology could be 'cultural'. I do not use the term 'cultural' in the sociological or anthropological sense, but in the strict sense, in reference to art and culture. In common parlance, art and culture belong together. The list of 'technology, art, and culture', however, is not perceived as a similar close unity, but rather, as a discontinuity. There is technology on the one hand, and art and culture on the other. It is this segregation, this perception of two distinct domains, that I would like to investigate today, in a historical perspective and with an emphasis on the 19th century.

The term 'technological civilisation' sounds strange as a description of our society. Isn't it remarkable that, although we are well aware of our dependence on technology down to the smallest details of our daily lives, members of the cultural elite and opinion-makers have the greatest difficulty appreciating technology as our culture? A few examples from the sphere of nature conservation in the Netherlands can serve to illustrate this point. The protection of nature incontestably belongs to the domain of culture. In the Netherlands, it has great public support. A spokesman of the association Het Zeeuws Landschap (The Landscape of Zealand) recently stated, in a radio programme, that he has 'mixed feelings' about the Schelde area, because the landscape there is magnificent – he called it a 'primeval landscape' – but the docks are always visible at the horizon, as is the Borssele nuclear power plant.

Mixed feelings, two non-integrated realities: unspoilt nature as opposed to technology that spoils everything. Another example is also taken from a recent radio programme. The warden of Oostvaardersplassen, a nature reserve in one of the polders of IJsselmeer, praised the 'completely natural' and consequently always 'unexpected' water level in his reserve, claiming it depends entirely on rainfall. What he conveniently omitted to mention was that not a single water level in the Netherlands is really natural, because if the pumps were to stand still, 65% of the national territory would be flooded. Actually, the Dutch are generally quite aware of this fact. Without these great technological efforts, Holland would cease to exist. Without a car, the nature lover cannot get to his primeval landscape. Why is it that we idealise an environment from which technology is absent?

Art and culture belong together, and technology stands apart, and, it seems, further in the background, and at a lower level too. This is a convention that is familiar to all of us, that need not be defended and is not seriously challenged. The distance between art and technology has a long-standing tradition. It is evident in 19th-century manuals on aesthetics, where it is phrased in concise terms. In aesthetics, art, after religion, was the most lofty pursuit of mankind. For through art, man was able to express and convey the highest ideals, such as piety, heroism, nobility, self-sacrifice, and, of course, love of one's neighbour and one's country. In this 19th-century vision, then, religion and art stood right at the top. Below them stood science, and then came technology. Art derived its high position from its lofty ideals, which were mainly expressed in monumental art. Within the arts, of course, there was also a hierarchy. Monumental art ranked highest, as it was dedicated to eternal values. The more practical the purpose of a work of art, the lower its status. Science was predominantly utilitarian, which is why it ranked lower than art. The most ideal sciences stood at the top: first theology, then philosophy. After science came technology. Technology was entirely devoid of ideals. It aimed not at higher things, but at practical matters. Technology was merely utilitarian. This hierarchy in which the ideal ranked higher than the material can be traced back to a Platonic origin. It had been passed on and adapted by Christian and Humanist philosophers for centuries, and was disseminated on a large scale in 19th-

century education. In this idealist aesthetics, it was self-evident that art was closely connected with the idea of civilisation, on account of its higher aspirations. Art was the means for visualising the Beautiful, the Good, and the True. By its beauty, it could transport and uplift the spectator. Technology, on the other hand, could not uplift at all. It could only solve practical problems, and in the concept of civilisation, therefore, it could only play a subservient role.

Around 1850, however, a new artistic programme emerged to compete with this idealism: realism. This was the art of artists who saw that the exalted ideals of beauty suited an orderly, bourgeois world, but remained theoretical in the daily reality of the common people. These artists drew their subjects from that everyday life. Although realist authors such as Emile Zola had a large readership, their work was strongly rejected by the guardians of civilisation. The artistic avant-gardes of the 20th century also remained marginal with their subjective and often ugly reality.

All this changed in the second half of the 20th century, when the museums and art schools elevated the pre-war avant-gardes to the artistic standard. The idealist aesthetics with its classic harmonies of the Beautiful, the Good, and the True became obsolete. With it, the foundation supporting that old and self-evident relationship between art and civilisation disappeared. The new artistic concepts were too individual, and often also too ephemeral or unintelligible, to be able to make any collective claims. Besides, the traumas of World War II had robbed the concept of civilisation of much of its lustre and force.

Thus, in the space of just a few decades, an age-old tradition was lost. These days, the cultural ideals of heroism, nobility, self-sacrifice, and patriotism are hardly ever a subject of public discussion anymore. To our sensibility, those ideals belong to the 19th century. And yet we still cultivate our collective ideals of beauty, virtue, and truth. However, the monuments that exemplify these ideals are no longer produced in the domain of art and culture, but by technology. They are the images of the latest car models and mobile phones, the billboards for the healthiest yoghurt, the architecture of the most recent shopping malls. For a millennium and a half, the word 'icon' referred to a man-made image of the Most High: Christ, the Virgin, or a saint. Since about 1990, hundreds of millions of people have understood the word 'icon' to mean a small

picture on a computer screen that represents a program, file, or function. The need for collective images of progress, of higher things, has not disappeared. However, it is now being fed by the practical metaphysics of technological miracles.

The assertion that technology is a form of culture is incontestable. Anthropologists, archaeologists, sociologists, and historians have observed and described this in all manner of ways. But in these cases, as we have remarked, they use 'culture' in the sense of the way a society perceives and organises itself, and of its motives and goals in these processes. In that sense, of course, technology undeniably qualifies as culture. At present, we can almost say it is our global, 'universal' culture. Exact science, the mother of technology, is claimed to be above all cultural differences, on account of its exactness. But is this science as universal as it is made out to be, and is it really so far above cultural discussions?

In 1998, the controversial British biochemist Rupert Sheldrake postulated that the 'exact' sciences are anything but exact. He showed that even the fundamental constants of nature, such as the speed of light and the force of gravity, on which the whole construction of the natural sciences is based, are not constant at all, but variable in time and across space. It is the corporate culture of these sciences that is keeping the ranks closed, on pain of excommunication, and that affirms the image of absolute constant exactness over and over again, even though research findings indicate the opposite.[1] Gender studies have shown that much technology realises the fantasies of men – and not those of women. Cultural differences, it seems, can give rise to two very different solutions to the same problem. I would like to cite an interesting example from the 1997 study by Eda Kranakis on the technological development of the suspension bridge. The American farmer and justice of the peace James Finley, who lived in a sparsely populated part of Pennsylvania, designed a bridge suspended from chains and patented it in 1810. All its parts could be made and repaired by any capable smith and carpenter. The design of the bridge was very simple and purely functional, without any aesthetic ambition. Kranakis compares this bridge to Claude Navier's designs for the Paris Pont des Invalides from a few decades later (1830). Whereas Finley was an inventor without a technical

education, Navier was a scientifically trained engineer. His plans were submitted to the experts of the Corps of Bridges and Roads, the technological elite of France, whose approval was required prior to execution. These judges praised Navier's design for its beauty and elegance, not just of its visual appearance, but also of its mathematical reasoning and calculation. Finley had arrived at the elements of his bridge by experimental means and with a view to the abilities of the village smith. Navier applied the latest theories in mathematics and physics, catered to the most up-to-date architectonic taste, and designed it in view of the state-of-the-art production possibilities of his day. His bridge has a free span of 170 metres. The bridge type of the Finley system could span 75 metres at most. Thus, two different types of suspension bridge were developed; two completely different solutions to the same technical traffic problem; two technological cultures. Kranakis describes how they both fared. Almost thirty bridges of the Finley type were built, some of which remained in use for a very long time. Navier's bridge was never even finished. Shortly before its due completion date, a burst water pipe adjacent to an abutment foundation caused one of the two pylons to subside a few centimetres, which in turn dislocated the suspension of the bridge to such an extent that the bridge had to be demolished. Two bridges, two cultures: the unwieldy but efficient DIY system of Finley versus the advanced but vulnerable technology of France. Navier's bridge was, first and foremost, meant as a monument in the classical sense, which, according to a 19th-century source quoted by Kranakis, 'let its disposition be calculated with the idea of forming an edifice approved by artists, agreeable to the public, honorable to the administration' [a monument that ....] interest and movement to all the magnificence of this part of the capital.'.[2]

These words cause us to shift our perspective. It seems that in 1830 Paris, engineering technology was a cultural domain that belonged in the sphere of art and culture. Navier and the authorities who judged his design considered the bridge both as an expression of monumental art and as a splendid product of technical science and utilitarian technology. We have just seen that technology was on a lower rung than the arts in 19th-century aesthetic theory, but there was one exception. That exception was architecture. Architecture integrated technology in the

domain of art, as it drew on traditions and conventions with which it was able to convey cultural ideas and ideals to the public.

This exceptional synthesis in itself was part of a long tradition. In fact, the very first textbook on architecture that has come down to us, De Architectura Libri Decem by the Roman Vitruvius (ca. 20 B.C.), already classified the work of the engineer under architecture. In the Italian Renaissance, this book and this view inspired a long series of treatises which were used all over Europe as references for monumental architecture. In the 17th and 18th centuries, the French Academy continued this tradition with new normative works. In many places in Europe, 19th-century architectural training was organised according to the classic academic ideas. In Belgium too, where the connection between architecture studies and engineering science remained close, architecture was conceived as an art, and in particular, as an art that does not just manifest itself as a visual play, but also as a corpus of theory and reflection and a corpus of a magnificent history; an art that is simultaneously connected, both materially and psychologically, with the needs of everyday life. In the Netherlands, things developed differently. In contrast to Belgium, this classical breadth and depth did not become institutionalised in Dutch architectural education in the 19th century. As a consequence, although architecture in the Netherlands is highly developed, both from the technological viewpoint and as an attractive economic product, its intellectual or explicitly cultural dimension lags a bit behind.[3] I am aware of using the term 'culture' in its 19th-century meaning now, namely, as the verbal culture of lofty ideas about the Beautiful, the Good and the True.

The 19th-century tradition to which Navier belonged was carried on in the next century. The 20th century also produced examples of this interconnection between technology, art, and culture. Prof. David P. Billington, who held the Sarton Chair in 1999-2000, argued, in his lecture in this auditorium, that the engineer Robert Maillart, trained at the Zürich ETH, developed his famous highly original concrete constructions inspired by his integral aesthetic ideas, and that his calculations were only of secondary concern to him. To quote Prof. Billington: 'His art dictated his science.'[4] In the past century, there were in fact quite a few designers who gave shape to this unity in their work,

even in the Netherlands. However, to this day, the Rotterdam architect Hugh Maaskant, who built up an impressive oeuvre in the post-war decades in which building technology manifests itself proudly as art, never played a significant role in the Dutch discourse on architecture.[5] This discourse concentrated on architecture as a mass-produced article, with publications such as John Habraken's book 'Supports: an alternative to mass housing' (1972, first edition in dutch 1961), in which the art of building was reduced to designing an efficient and economical building system.[6]

With these examples, we see the two sides of the matter we are investigating now. One side is that of the centuries-old tradition in which Architectura is the art that does not make technology subservient, but fully integrates it and elevates it in its realisation of beauty, a beauty that is also intended to cultivate and uplift the spectator. On the other side, we have architecture without any higher ambitions, the architecture of realism, aimed only at concrete, material functions and conditions. In this architecture, beauty is less important that affordability and utility. In the first case, there is an integration of technology, art, and culture; in the second, there is much attention for technology, but the discourse about art and culture is almost trivial.

These two fundamentally different notions both came to the fore from the mid-19th century onwards. That they did so in that period is no accident, because this was also when the natural and engineering sciences and their applications started celebrating their unequalled triumphs. In scientific literature on the history of technology it is customary to describe these triumphs in terms of the Darwinistic evolution model, i.e., an evolution that starts with simple techniques and gradually, through adaptation, separation, and specialisation, presents a picture of increasing complexity and sophistication. When discussing the effects of these developments on society, this is usually done in quantitative and material terms, such as greater production, cheaper products, more traffic, and better living conditions, especially as regards food and health. But the technological revolution of the 19th century must also have caused a profound mental shift. The effect of a technical innovation is much greater than the change it brings to the material conditions of our existence. The studies of Jonathan Crary (Techniques of the Observer,

1990 and Suspensions of Perception, 1999) have shown that the enormous – because rapidly industrialised – audiovisual inventions such as photography and film, and sound recording media such as the gramophone, produced profound changes in the perception and the reproduction of reality. Stephen Kern presented similar observations in his The Culture of Time and Space (1983). Both researchers argue that the great artistic innovations of the second half of the 19th century, such as Impressionism, Cubism, and Symbolism, were the direct consequences of the invention of photography and film. These technological discoveries changed the reproduction of the visible world, but also the perception of reality.

I would like to take this one step further and pose the question whether the technological revolutions of the 19th century changed the old concept of civilisation. In other words, whether they ousted the idealistic ideal of civilisation, filled with Christian and Humanist metaphysics, and supplanted them with the ideals of a technological civilisation. It is important not to define that idea of technological civilisation too narrowly. It will not do at all to think only of a collective desire for a car, a DVD player, or shopping via the Internet. These are merely exterior characteristics. Technological civilisation is embedded in our lives much more deeply and structurally. It is also important that we reflect on this idea of technological civilisation with as little prejudice as possible and that we avoid almost subconsciously rejecting it for being base. For when we do that, our judgement is inspired by the old ideal of civilisation that posits lofty ideas. When we reject it for that reason, from that higher standpoint, we will fall victim to that familiar inner conflict expressed by the warden of Het Zeeuws Landschap, whose exalted idea of pure and innocent nature collides with his perception of base technology at the horizon and with the low and guilty reality of the polluting motorist he would become once again after the interview.

The technological civilisation we are thinking about now is not just simple, base, or coarse. It also has its own richness, completeness, high and low points, its own metaphysics, its own collective values and standards, its own ideals for the future. But the technological civilisation has little or no need for history. Of course, there is a past, but reflecting on it is useless and superfluous. Technology looks forward, not backward. It is common knowledge that the young generations are losing

their interest in history at a high rate. They feel it has no bearing on their daily lives. This development is not limited to young people. In an interview, the Dutch prime minister stated that we could no longer close our eyes to the fact that Western society, in very many respects, was shaped by Christian concepts and institutions. This drew scornful criticism from journalists who did not recognize the prime minister's remark for the statement of historical fact that it was, but took it as an expression of political arrogance from a Christian Democrat. I suspect that it was not postmodernism that made history obsolete. Postmodernism is a description of contemporary culture rather than an explanation. The marginalisation of history was probably the result of the second wave of technological revolutions that changed our lives after 1950. The first wave was much smaller, but just as fundamental. It started a hundred years earlier.

One of the foundations of this technological civilisation is the idea of exactness. Perhaps that is its only essential fundament. Exactness is dependable. It dispels doubt. The facts don't lie. How and when were these notions so structurally embedded in our collective consciousness? Revolutions in the fields of mobility and communication, new and exact coordinate systems of place and time, and an enormous increase in calculating power changed the world after 1850 as much as they did in the late 20th century. I would like to cite a few examples from that early era, first to give an impression of the scope and extent of these innovations. Similar to the way the computer changed our mental and physical world in the last century, the railroads and the closely connected telegraph changed the structure of the 19th-century world as people knew it then. They changed not only its physical characteristics, but also the world as a mental construct. Then, too, the media played a major role. The examples I give below are taken from Dutch 19th-century sources. The news coverage of the European railroads started up in the forties. Through the media, the public saw the railroad network grow year after year, gradually connecting all parts of the globe. Let us look, for instance, at the reports that were printed around 1870. Most of the major rail connections in Western and Central Europe had already been built by then. In Northern and especially in Eastern Europe, however, the work had only just begun. In 1870, an article in the magazine De Opmerker, a

weekly journal for architects, engineers, contractors, and manufacturers, reported that the US were working on 300 railway lines at the same time. Some of those lines were the super railroads that would soon open up the continent that was still so unknown, such as the Union Pacific, the Great Western Railroads, and the tracks that were finished in 1871 that connected Hudson Bay in Canada directly with the Gulf of Mexico. Around 1870, new lines in the Americas, not just in the US but also in Mexico, Honduras, and Panama, achieved very fast so-called 'transatlantic' overland connections between the Atlantic and Pacific Oceans. In South America, at the same time, new railroads connected the gold and silver mines of the Andes and the economy of the interior with the oceans. In 1869, the Shah of Persia (Iran) granted a British company the monopoly on building and running the Persian railways. Shortly after 1870, railways were built in Turkey. In vast British India, that comprised the current Pakistan, India, Sri Lanka, Bangladesh, Burma, Malaysia, and Brunei, the great railways were largely finished by around 1870. Even the very sparsely populated Australia and New Zealand, both also British territories, had their own railways. Only Africa, the largest continent, remained insignificant and peripheral in this new global network. Around 1870, our reference year for this example, the total combined length of all the railways on all the continents amounted to three times the circumference of the earth. Twenty years later, around 1890, it had grown to fifteen times that circumference.[7]

The electromagnetic telegraph developed by the American Samuel Morse was presented to perplexed scientists for the first time in 1837. It caused a furore. In 1840, Britain started building its network, at first national but soon international, with London as its nerve centre. The telegraph network was organisationally and physically integrated with the railways. Every railway station doubled as a telegraph station. The railroads reserved a few telegraph wires for their own use and made the others available to the public, at a fee. Germany and the US had their first commercial lines in 1843, soon followed by France, Belgium, and the Netherlands (1845-1849). Via a submarine cable across the Channel, England was connected to the Continent in 1852; by 1857, there were already six of these cables. In the same year, a cable was laid across the Mediterranean to Tunis. To the East of Europe, the telegraph reached St.

Petersburg and Istanbul. In 1858, almost all European capitals were connected to the network. The British had also connected the capitals of British India and were planning to connect Turkey with London via that network.

By 1857, the speed at which the telegraph had spread across the world since its invention was twice that of the railways earlier. In America, it spread even faster than in Europe. In that year, when 'both the Old World and the New [were] spanned by this magical network of civilisation' ('zoowel de oude als de nieuwe wereld met dit toovernet der beschaving overspannen'), its length was estimated at approximately 220,000 km, more than five times the circumference of the earth.[8] This was on the eve of the great breakthrough, i.e., the line that connected Europe with America across the Atlantic. After repeated setbacks, this communication was finally achieved in 1866. This line would be a tremendous success. After 1866, sending a message around the world was a matter of minutes.

The way people determined their position on earth changed too. New forms of cartography and large-scale international surveying projects yielded an exact system of coordinates. In 1874, the Netherlands started a large-scale project of precision levelling to determine the contours of the land. They were combined with the levelling surveys of Belgium and Germany, and through these, with geodetic surveys of France, Switzerland, and other countries in Central Europe. A similar operation took place with regard to measurements of the length, breadth, and surface area of the land (the technical term is triangulation). As with the international precision levelling project, it was Germany that took the initiative for the international triangulation, in 1861. In order to get results as complete as possible with regard to the true form and size of the earth, a network of triangles between Oslo and Palermo and between Brussels and Warsaw would be measured. The Netherlands was also invited to take part in this 'Central European Arc Measurement' project. After Russia joined in 1867, its name was changed to 'European Arc Measurement'; almost twenty years later, the operation became global, when the United States and the South-American countries joined in 1886.[9] In these decades, the world became a system with networks and coordinates.

This new exactness greatly amplified the power and effectiveness of technology. This was demonstrated, for instance, by one of the most important public works carried out in the Netherlands in the 19th century, the normalisation of the great rivers. In the course of the 18th century, the rivers had become very dangerous, and the low-lying areas had been struck by a succession of disastrous floods throughout the 18th and the first half of the 19th century. The campaign to improve the situation was started in 1850. It entailed the systematic recording of breadth and depth measurements of all the rivers. In 1850, there were still very few facts to go on. Many decisions were based on practical experience or intuition. The enormous task of taming the wild rivers commenced with the building of an equally enormous collection of facts. This comprised systematic measurements of the water levels, flow rates, and ice movements, the duration and effects of the tides, depth soundings, and observations of silt content and sedimentation. When the results of the national and international triangulations became available, the rivers acquired an integrated system of coordinates. All the figures collected on any aspect of the rivers and anything that could be useful to technicians, contractors, legal experts, fishermen, or whoever else involved, could now be located immediately thanks to these coordinates. In conjunction with the exact measurements, the steadily increasing computation power enabled the virtual but exact expression of a formerly unknown technological reality. For instance, in 1873, a measurement of the water level at the German border made it possible to forecast the next day's water levels further downstream. Similar developments took place in weather forecasting. A European system of geographic coordinates and telegraphically communicating weather stations enabled meteorologists to learn how to calculate the systematic behaviour of the atmosphere and predict developments in the near future.

Exact measurement and computation changed reality. Here is one last example, from the international cargo trade, from 1891:

'Thus, it is not uncommon for the longest detours to be made. Grain from Russia that is exported from Odessa and is destined for Switzerland, for example, frequently travels not via Genoa and Trieste, but via Rotterdam.

(...) And this should not be surprising, since, according to German statisticians, the cost price of shipping by rail (per tonne and per kilometre) can be determined at 1.5 pfennig, while water carriage costs only 0.8 pfennig.'[10]

There is still the question of how this process, in which mass mobility and mass communication changed the world, related to the concept of civilisation. The first observation we can make is that the hallmarks of civilisation remained those of the past for a long time. For centuries, it was customary for purveyors of culture to make a so-called Grand Tour of the cradles of Western civilisation, Italy and Greece. In the 19th century, however, the focus of interest shifted to America. The examples of the journey made by the French nobleman Alexis de Tocqueville and the famous account he gave of it, De la démocratie en Amérique (1835-1840), were followed by many other travellers and travel reports. All marvelled at that wondrous society that was called the New World, the land of the future, and its culture in which efficiency, utility, and success were the values and standards. In America, history had at most marginal meaning. The points of reference, the coordinates of this new civilisation, were located in the present and in the future.

In Europe, this realistic civilisation emerged in Germany. Since the 16th century, Germany had been a patchwork of more or less autonomous duchies, principalities, prince-bishoprics, kingdoms, and free city-states. Under Prussia, they became united into one state in the course of the 19th century. The resulting great concentration of power revealed itself for the first time in the crushing victory over France in the war of 1870-1871. The new Germany no longer drew its strength from the intellectual force of men such as Goethe or Hegel, but from the energy of the likes of Alfred Krupp, Emil Rathenau, and Bismarck, the most powerful protagonists of the steel industry, electrical engineering, and Realpolitik, respectively. Were the fundamental features of this new Germany invented and tested in the campaign against France? Alois Geigel was certainly not a warmonger. He was an educated doctor with several publications on public health to his name. In 1877, he wrote with love and pride about the excellently trained German soldiers who were pouring out from endless trains all over France in 1870 and were given their orders via the telegraph:

'How could their forebears have had even an inkling of the ease and fabulous speed with which such masses were released onto the battlefield by the snorting iron horses, of the unique command that controlled the far-flung armies from one single point by means of an electric wire [...], moreover, of the almost even more admirable never-failing care and provisioning of such great armies and the nursing of their wounded and disabled? And all this was done while the German people calmly proceeded with their work on their own soil and in utter peace and quiet, while it was ready to fill, at any moment, the places vacated by the fallen with thousands of strong soldiers without noticeably reducing the stock. Truly, such facts make the heart swell and overflow with great admiration for the results of modern civilisation.'[11]

In a footnote, the Dutch translator of this article made it clear that he understood 'civilisation' to mean something quite different. This difference of opinion implied two antagonistic definitions of civilisation: the pragmatic concept of Geigel as opposed to the idealistic concept of the Dutch translator; the first with an ethics of success and utility, the second with an ethics of good and evil. As was said earlier, Classical Antiquity and the Bible were the primal sources of that 'ethical' concept of civilisation. It is interesting to see that the importance of the Classics was already being debated in Netherlands as early as 1855. Classical education was criticised for not offering any answers to the new demands of the modern age. The editor of the magazine Praktische Volksalmanak, a prominent economist, voiced his concerns about the education of the young people who would later have to lead the country and wrote: 'Physics and chemistry before mythology and the Greek heroes! Cotton, or indoor feeding, before the Roman emperors!' And when it came to languages, the living languages were to come first. First English, then French, and then, perhaps, Latin could be added: 'Away with all that useless ballast!'[12] This was in 1855.

In the following decades, technology became applied science, and in the process, it effectively turned into practical and realistic civilisation. In 1871, a professor at the Delft Polytechnic, the engineer D. Grothe, wrote a book on mechanics that, according to its subtitle, was intended as 'a textbook for manufacturers and industrialists' and 'a

reader for civilised people'. In 1881, following foreign examples such as Nature, La Nature, and Scientific American, a popular monthly magazine on the natural sciences was launched in the Netherlands. The editors of De Natuur, as it was called, opened the first issue with their programme: 'It cannot be denied that the natural sciences play such a prominent role in this modern age that nobody can afford to remain a complete and utter stranger to their field. Whereas for many, the knowledge of nature may be considered a major aid to civilisation, that knowledge, to others, is indispensable in their undertakings.' The editors counted on it that 'our magazine will be a welcome presence in every civilised household'.[13]

These voices clearly indicated a drastic change and announced an age in which ignorance of technical matters would be considered uncivilised, a new kind of illiteracy.

More than a century has passed since then. Technology now determines, down to the smallest detail, the way we work, the way we live, our leisure, our communication, our food, our mobility, and consequently, the way we think. The New World that emerged in the 19th century in America has come to the fore all over the world and has become fully internalised in Western Europe. It is a world in which efficiency, utility, and success are the dominant values and standards, and in which the old hallmarks of civilisation have become obsolete. Last week, the Roman newspaper Il Messagiero ran a story about the official Roman tourist guides whom the incredible ignorance of the latest batch of tourists brought them close to despair. It seems there was one American who said: 'Sorry, you keep mentioning before and after Christ, but who exactly was that guy?' Or take the question they are asked almost daily about the Coliseum, which is why the Romans built such a ruin.

Our New World lacks a collective, uniting cultural programme, that is to say, 'cultural' in the old sense. Our uniting cultural programme in the new sense is called economic growth. The only advancement we aspire to collectively is material in nature. This is not a value judgement, but an observation of fact. We live in a realistic technological civilisation and are ready to defend it at all costs, quite simply because it happens to be our way of life. But at the same time, there is a sense of embarrassment about its limitations, its superficiality, and its sometime dirtiness, which are its characteristics. Is this shame not caused by the

remnants of the Classical, idealistic civilisation that have lingered on in our minds, just like our bodies still contain useless traces of earlier stages of our evolution?

Perhaps there is more to it though. The history of mankind is a dynamic process. There is no reason to assume that our current technological civilisation is the final stage. Change is inherent to life. There will always be individuals in search of the essential who will manage to put their ideas on the agenda with great effect. I refer to Le Corbusier, one of the most influential architects of the previous century, and quote from his Vers une architecture from 1923: 'Culture is the flowering of the effort to select. Selection means rejection, pruning, cleansing; the clear and naked emergence of the Essential.'[14]

Le Corbusier loved Greek temples as much as he loved the latest cars; he used both to illustrate his argument. 'The Essential': the word is a reformulation of 'the Good, the Beautiful, and the True'. Perhaps that classic adage is timeless after all. Perhaps, in the end, it is even a valid guiding principle in a technological civilisation.

Notes

[1] Rupert Sheldrake, Seven Experiments That Could Change the World: A Do-It-Yourself Guide to Revolutionary Science (London 1994), chapter 6.

[2] Eda Kranakis, Constructing a Bridge. An Exploration of Engineering Culture, Design, and Research in Nineteenth-Century France and America (Cambridge, Mass./London 1997),170.

[3] Cf. Gerrit Smienk, Johannes Niemeijer (eds.), De hand van de meester. Het ontwerponderwijs in de praktijk (Rotterdam 2000).

[4] David P. Billington, 'Robert Maillart: the Engineer's Synthesis of Art and Science', Sartoniana 13 (2000), 25.

[5] On his work, see Michelle Provoost, Hugh Maaskant. Architect van de vooruitgang (Rotterdam 2003).

[6] On Habraken, see Koos Bosma, Dorine van Hoogstraten, Martijn Vos, Housing for the Millions. John Habraken and the SAR (1960-2000) (Rotterdam 2000).

[7] The totals from 1870 and 1890: G. Vissering, 'Spoorwegen in Europa en Amerika', De Economist 44 (1895), 689. A reminder: the circumference of the earth at the Equator is 40,076 km.

[8] 'De telegraaf naar Amerika', De Economist 6 (1857) I, 1.

[9] The project of 1861: G.B.H. de Balbian 'Graadmeting. Geschiedkundig overzicht', TKL 5 (1889), 200-202; the Dutch contribution: J. van Roon 'Over de officieele kartografie van Nederland na 1864', TKNAG 2nd series vol. 45 (1928), 841.

[10] 'Zoo komt het niet zeldzaam voor dat er de grootste omwegen worden gemaakt. Granen uit Rusland die van Odessa worden uitgevoerd en die bijvoorbeeld naar Zwitserland moeten, gaan vaak niet over Genua en Triëst, maar over Rotterdam.(...) En dit behoeft ons niet te verwonderen; immers terwijl men volgens Duitsche statistici den kostenden prijs van het vervoer per spoor (per ton en per kilometer) op 1.5 pfennig kan stellen, rekent men voor het transport te water slechts 0.8 pfennig.' H.A. van IJsselstein, in the minutes of a meeting of the Koninklijk Instituut Van Ingenieurs (Royal Institute of Engineers) on 10 February 1891, Algemene Verslagen KIVI 1890-1891, 67.

[11] 'Hoe zouden hunne voorvaderen ook maar een flauw denkbeeld zich hebben kunnen vormen van de gemakkelijkheid en fabelachtige snelheid, waarmede zulke massa's door de snuivende rossen op het slagveld werden geworpen, van de unieke leiding, die met de bliksemsnelheid der gedachte de wijd verspreide legers door middel van de electrische draad van één punt uit beheerste [...], hoe voorts van de bijna nog bewonderenswaardiger, nooit in gebreke blijvende verzorging en voeding van zoo groote legers en de verpleging van hun gewonden en invaliden? En dat geschiedde alles terwijl het Duitsche volk op eigen grond in den volsten vrede rustig voortwerkte, terwijl het bereid was ieder oogenblik de opengevallen plaatsen der gevallenen met duizenden krachtige krijgers zonder merkbare afname van den voorraad aan te vullen. Waarlijk, zulke feiten doen het hart zwellen en overvloeien van hooge achting voor de uitkomsten der moderne beschaving.' S.Sr. Coronel, A. Geigel Handboek der openbare gezondheidsregeling naar de behoeften en wetgeving van Nederland, (The Hague 1877), 4. Coronel adapted Geigel's Handbuch for the Netherlands and copied this passage in full ('however much the conclusion can be disputed') because, as appears from his footnote, he thought it was interesting from the 'culture-historical' point of view.

[12] d.B.K. [J.L. de Bruyn Kops] 'Wat zal men zijn jongens laten leeren?', Praktische Volks Almanak 2 (1855), 1855, 108.

[13] 'Het kan niet worden ontkend, dat de natuurwetenschappen in den tegenwoordigen tijd een zoo voorname rol spelen, dat niemand op haar gebied geheel en al vreemdeling mag blijven. Terwijl voor velen de kennis der natuur als een belangrijk hulpmiddel tot beschaving mag beschouwd worden, is die kennis voor anderen onontbeerlijk bij de uitoefening van hun bedrijf.' (...) 'ons tijdschrift een welkome verschijning zal zijn in elk beschaafd huisgezin.' D. Grothe Mechanische technologie, ten dienste van het middelbaar onderwijs, een

leerboek voor fabrikanten en industrieelen, een leesboek voor beschaafden (Gorinchem 1871, second, revised edition); 'Ons program', De Natuur 1 (1881), 1-2.

[14] Le Corbusier, Towards A New Architecture (London 1972, translation of the original French text from 1923), 128.

SARTON MEDAL LECTURES

LAUDATIO JOHAN MATTELAER

Robert Rubens

Mr.Johan Mattelaer is born in Courtrai in 1937.After finishing his secondary education in the Saint Amandsschool in Courtrai in 1955, he started his medical education at the university of Leuven. At the same university he graduated as MD in 1962. He became a surgical trainee at the Saint Joseph Hospital in Bruges and the Our Lady Clinic in Knokke. Following the preliminary surgical training he became an urological surgeon during two years peregrination through Europe. The first place where he went was Prof . Moonen, head of department urology in Nijmegen. Later he also went to the University of Lille,department of urology (Prof Wemeau) and the university of Innsbruck (Prof. Marberger) . Meanwhile he spent short periods in London , at the Hospital for Sick Children (Dr. Ines Williams) and the Middlesex Hospital (Dr.Tuner Warwick).
In 1969 dr. Mattelaer received the ministerial approval as an urological surgeon allowed to work in the Belgian health services. In the same year he also gained the ECFMG certificate.

Dr.Mattelaer is a founding member of the "Belgische Vereniging voor Urologie" and has been president of the society in the period 1990-1992.
In 1973 he became member of the "Société Belge d'Urologie", holding the office of vice-president in 1994 to 96 and president in 1997 to 99.

He has been an extraordinary member of the Dutch Society for Urology from 1975 to 1998.. He has been member of the European Society of Paediatric Urology from 1992 to 1999.

Currently he is member Belgian – Dutch Society of Fertility, the European Association of Urology and The Société Internationale d'Urologie.

Dr.Mattelaer is a fellow of the European Board of Urology and became a member of the residency review committee of the European Board of Urology.

Dr.Mattelaer has been accepted and confirmed as a tutor and a mentor in the specialisation of Urology since 1986.

His research commitment has been recognised by becoming a member of the European Organisation for the Research and Treatment of Cancer from 1990 to 1997;

Dr.Mattelaer was a lecturer extra-muros at the Katholieke universiteit of Leuven from 1988 to 1993 and was a lecturer at the Training college for Nurses in Courtrai from 1972 to 1997.

In 1969 he started working in the city of Courtrai as a consutant in the department of urology of the hospital. At the start he was the head of department of urology in The Our Lady Hospital in Courtrai remainig there until 1988, later (since 1988) he was the head of the department of Urology of the Saint Martin Hospital in Courtrai.

Dr. Mattelaer published more than 142 papers in the international and local medical press about all subjects of urology. His major interests were the uretral surgery, the correction of hypospadias, cancer of the prostate, male impotence and fertility, anti-androgens and uro-oncology.

During the same period dr.Mattelaer became more and more interested in the history of Urology. In the latter field he produced also more than forty papers. As we however know it is in producing books that reputation and excellence is seen in the historical field.

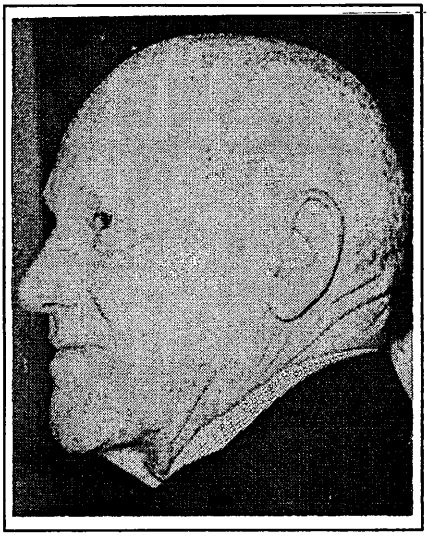
Dr. Mattelaer , who is a world traveller selected during years of solid effort pictures of the phallus world wide. The result of this exercise produced "The Phallus in Art and Culture", his opus magnum of 151 pages, existing in Dutch and English. It discusses the presence of phallic symbols in all cultures. The reader is confronted with pictures as well from ancient Egypt, the pre-Colombian America as modern culture.

Furthermore by picture and background study it unambiguously proves that phallic culture is present everywhere.

More recently he published "From ornamentation to mutilation", a new book of 172 pages with more than 320 pictures about the castration and all the circumcision during all historical periods and cultures.

Recognised by the European Urological Society as the expert on the history of urology dr.Mattelaer is one of the editors of "De Historia Urologiae Europae".

All these activities never let dr.Mattelaer forget our universal duty towards the less favoured of this world. It is important obligatory to mention that despite a full professional life and his historical endeavours dr. Mattelaer participated to numerous missions in Cameroun, Zaire, Ruanda and Ethiopia where he used his surgical skills. The activity underlines and shows the deep human interest of his noble personality.
It is therefore a privilege to be able to introduce him in this Sarton lecture.
In the lecture titled "About urinating, not being able to urinate and collection of urine" he will certainly let us travel around many techniques and historical instruments of the urological practice.



CATHETERS AND SOUNDS: THE HISTORY OF BLADDER CATHETERISATION AND SOME HISTORICAL ASPECTS OF URINERECIPIENTS AND URINALS

Johan J. Mattelaer

> "There is little doubt that the catheter is the most valuable single instrument in the urologist's armamentarium."
>
> Ralph R. Landes M.D.

1. Catheters and sounds: the history of bladder catheterisation

The term 'catheter' is derived from the Greek word meaning to let down into, or send down.
The Romans used the word *demissorium* or *demissum* or *immissum*, meaning 'what is brought in'. Celsus designed the instrument as a *fistula*, and the later Romans named it *syringa*. The French anatomist Riolan described it as *claris vesicae*, which is the word *upu* or 'key' for the Mesopotamians. Later on, French doctors described the instrument as *algalie*, a name derived from the Arab language. In the 19th century the word *algalie* was reserved for hard silver catheters, and 'catheter' for rubber malleable ones.

Emptying the painful, overfilled bladder must have been one of the problems of mankind since ancient times. Catheterisations were reported to have been accomplished with reeds, straws and curled-up palm leaves. The Chinese used leaves of *allium*. *Allium* is the generic name of the onion family, and the long, thin leaves are hollow. When properly dried and prepared, and sometimes covered with Chinese lacquer, they would have made excellent catheters. The Sumerians, the antecedents of both the Babylonians and the Egyptians, may even have used gold to make

catheters. The Babylonian Physicians inserted directly pharmalogical prescriptions consisting of plant and mineral substances into the urethra through a tube.
"If a man's urine constantly drips and he is not able to hold it back, his bladder swells and he is full of wind, his urine duct is full of blisters: in order to cure him, bray *puqutter*, crush it in pressed oil, and (blow) it into his penis through a bronze tube." (Köcher F.)
However, we have no way of knowing how long the tube was, or whether it could in some cases also has functioned as a catheter in case of obstruction.
Because it is soft and malleable, gold was ideally suited for this purpose. In the Indian Vedas some catheters were described as coated with lacquer and lubricated with ghee (clarified butter). Sushruta, who invented the lithotomy position, is supposed to have used bladder catheters, but this is denied by Müller, who stated that the Hindu civilisation did not know about catheters. Although Zysk in his "Religious Healing in the Veda" writes that in the Veda a simple method is described in which a reed was used to cure bladder retention. An outline of Persian urology is found in the Yadiguiar of Ibn Cherif, who practised in Asia Minor (probably at Broussa). Catheterisation is suggested in a passage which advises the insertion into the urethra of polished twigs of the plant *tham teresi*. The Greek Erasistos (310-250 BC) of Kos used an S-shaped catheter. In the excavations of Pompeii, Roman metal catheters were discovered. Galen (131-210 AD) also demonstrated an S-shaped metal catheter.

The next significant step forward was a flexible, more malleable catheter devised by Avicenna in 1036. Avicenna was the first to insist that catheterisation should be done gently and without force. With this in mind, he designed catheters 'ex lenioribus corporibus et magis susceptibilibus flexionis' made from the skin of animals or fish, treated with an ointment of white lead and ox blood to make them firmer, and lubricated with soft cheese.

Abulcasis (936-1013 AD) practised at Cordoba. His technique of catheterisation is that of Paul of Aegina (5^{th} century AD) : 'The bladder should be emptied by a slender silver catheter expanding at its outer end

into a small tunnel'. Arcularius († 1484) also mentioned flexible catheters made of paper, wood or leather.

But in mediaeval times the silver catheter became the most popular type. Silver was chosen for several reasons: it was easily formed, easily bent as desired, and it was said to have some antiseptic function. The catheters used by Ambroise Paré (1564) were curved over a considerable part of their length. Paré writes : "Or les Sondes doiuent estre proportionnees selon le sexe et les aages. Partant il en faut auoir de petites, longues, moyênes, grosses, menuës, courbees, et droites. D'auâtage, lors qu'on les met en la vessie pour les faire vriner, il y faut mettre dedâs vn filet d'argent, pour empescher que quelque humeur ou sang ne s'engorge au bout, qui seroit cause que l'vrine ne pourroit passer au trauers : et quand elle sera dans la vessie, on doit retirer le fil d'argent, àfin que l'vrine passe librement au trauers d'icelle."

Fabricius of Acquapendente (16th century) described catheters made of silver, copper, and brass, but also of horn. He noted that: 'the Ancients made only a single orifice at the end, the moderns also at the side'. He also mentioned a catheter made of textile, impregnated with wax and moulded on a silver sound.

Some years later the Flemish scientist Van Helmont (1578-1644) applied the same principle, but instead of textile he used chamois skin, treated on the outside with lead and linseed oil. He introduced this catheter with the help of a stylet, made of whale bone. This allowed him to catherise the same patient forty times a day!

Later on, the woven catheter was produced, and the silk woven varnished catheter is its direct descendant. Woven catheters were of tubular construction, soaked in linseed oil and then dried.

Scultetus (1595-1645) of Ulm described and illustrated various surgical procedures, including catheterisation in his well known *Armamentarium Chirurgicum*. It is interesting to note that in mediaeval times, and even in the Renaissance, catheterisation was done in the upright, kneeling or sitting positions [Fig.1.].

Like many surgeons of this period Saviard filled the eye of his catheter with butter to prevent the entry of blood during the passage.

The silver woven, coated catheter is of course much smoother, more regular and easier to make. So is the catheter made of flat silver wires, spirally wound by the Dutch surgeon Van Solingen and described in his book *Manuale Operatien der Chirurgie* (1684).The Dutch translation by Hendrik Ulhoorn of Laurens Heister's book *Heelkundige Onderwijzingen* (1776) also describes a silver catheter.

In 1752 Benjamin Franklin described a silver catheter to his brother: 'It might be flexible, but must be covered with a 'fine gut', or rubbed with tallow to fill the joints'.

Catheterisation with a metal catheter was extremely difficult, and was known as a 'tour de maître' (attributed to Mareschal), or 'tour sur le ventre' and only a few doctors and surgeons were able to perform this 'tour de maître'.

J.L. Petit (1674-1750) invented a catheter with a double curve, but it was in fact Louis Auguste Mercier (1811-1882) who in 1836 invented the *coudé* catheter and in 1841 the *bicoudé* catheter. (*Coudé* means 'elbow' in French) [Fig.2]. Both were metal catheters. The coudé catheter provoked a lot of discussion since a few years later Leroy claimed that he was the real inventor of the coudé catheter which he did not name 'catheter à courbure' like Mercier, but 'à toute petite courbure ...'. And in 1857 the British journal *The Leech*, in Cardiff, published a biography with a picture of Emile Coudé as the inventor of the bicoudé catheter ! This was strongly contested by a letter in the *British Medical Journal* and followed by another letter published in the *The Lancet* from a certain Hercule Coudé who claimed that Emile Coudé was not only his uncle but the real inventor of the Coudé catheter. Howard Hanley later claimed that the real inventor was not Monsieur Coudé, but his half brother Bicoudé.

In 1875 J.J. Cazenave published a detailed monograph on his experiments with catheters, extending over a period of 20 to 30 years,

with whale bone, narwal tusks, and ivory tubes, and finally succeeded in producing a flexible and smooth catheter of real ivory, conforming to the shape of the urethra.

The introduction of catheters made of elastic gum or rubber was an important step forward. Herissand in France suggested that rubber might be used for the manufacture of catheters and Troja, an Italian surgeon, tried to put this idea into practice, but without success. In 1768 Macques had the same idea, but it was a silversmith in Paris named Bernard who had the idea of covering and impregnating a woven silk cylindrical tube with rubber. Still this first rubber catheter was of very poor quality because it became weak at body temperature and friable and rough through air contact. Fragments remained in the bladder and there was a lot of encrustation. Rubber could not be formed and shaped as desired until 1839 when Goodyear invented vulcanisation. By this vulcanisation technique the properties of firmness, flexibility and durability could be improved.

At the hospital St. Louis in Paris, Auguste Nelaton [Fig.3.] and Goodyear's vulcanisation process was used to produce what is still known and used as the Nelaton type of catheter of red rubber, with a solid tip and one eyed [Fig.4.]. The 'sondes en caoutchouc rouge' of Nélaton had a narrow lumen and could not be used for very long because the rubber became hard and friable. The rubber catheter was subsequently perfected and patented for commercial use by James Archibald Jacques, manager of a rubber factory in England.

In the United States it was not until 1883 that Petrie, a Frenchman of Philadelphia, began to manufacture catheters. Roy, a son-in-law of Benas, a Parisian instrument maker, established a catheter factory in a suburb of New York City around 1879. The business closed about 11 years later. George Tiemann and Company of New York City became the first major manufacturer of rubber catheters in the US around 1876. By 1893 about one half of the one million catheters and bougies used annually in the US were produced domestically.

Once the use of rubber and gum elastic catheters became widespread and production increased, some method of standardisation became necessary. Joseph Frederick Benoit Charrière, a French instrument maker and a contemporary of Nelaton developed the French scale, still the most widely used today, based on the metric system, and promulgated by the French Academy of Science in 1799. His scale was based on one third of a millimetre in the diameter of a bougie being equal to one unit in size. Thus a 1 mm catheter is a no.3 French. The system was modified a few years later by Bénique. He based his scale on one-sixth of a millimetre so that a no. 1 charrière was equal to a no. 2 bénique. The English, who always seem to like more complex measurement systems, had a scale based on differences of one sixty-fourth of an inch in diameter, which was known as the Weiss gauge (after one of the leading instrument makers of this period). Sir Henry Thompson, the English father of urology, when advocating adoption of the French scale as being more precise said: 'We must be cosmopolitan and tolerant'. And so in 1922 the Weiss gauge scale was changed and the English also employed the metric system. It was based on a scale of 0.5 mm in diameter, beginning with a no. 1 English equal to 1.5 mm in diameter.

One of the requested developments was a catheter that could be retained in place through its own configuration. Most indwelling catheters were taped or tied to the penis in men, and they were sometimes sewn to the urethral orifice in women.

In 1822 Theodore Ducamp used inflatable bags on his dilating bougies. The bags were formed of Goldbeater's skin, a submucosal layer of the intestine of oxen. In about 1841 Reybard designed a self-retaining catheter. One part was held in place by a movable flange and the other part fitted with a small inflatable balloon: the prototype of the Foley catheter [fig.5]. It was published in his book: *Traité Pratique de Rétrécissements du Canal de l'Urèthre* (Paris 1853) and was introduced as 'sonde à fixation automatique'. Later on, self-retaining catheters were designed by Lebreton, Desnos, Holt and Dowse.

In 1872, J.J. Wright, a surgeon from Halifax in Yorkshire (England), designed a rubber catheter with flexible shoulders. It was not until 20

years later that De Pezzer gave an account of his mushroom-ended catheter at the Congrès Français de Chirurgie (1890). Two years later, in 1892, Malecot, a senior intern of Felix Guyon described the 'sonde se fixant d'elle-même à demeure dans la vessie', a wing-tipped catheter known by his name. Numerous other self-retaining catheters were described during the early part of the 20th century. John R. Herman mentioned having made a 5 cc self-retaining catheter in 1927 by tying a balloon made of rubber to a two-way woven catheter (the idea of this catheter came from Dr. Vincent Odolo of Providence, Rhode Island). In use, this catheter proved impractical as the quality of rubber available at that time caused the balloon to disintegrate very soon after coming into contact with the urine in the bladder.

It was not until latex rubber became available in the early 30s that the 5 cc balloon self-retaining catheter became practical.
In 1929 Dr. F.E.B. Foley of St. Paul, Minnesota, ordered Bard to make a longitudinally-grooved catheter for him, to which he attached an inflating tube and a balloon by means of a fine silk thread and waterproof cement. During this period, Dr. Thomas M. Jarmon of Tyler, Texas, contributed considerably by inventing a very ingenious method of tying the bags. The first balloon catheter commercially manufactured and sold was presented to the profession by Dr. Hobert Dean Belknap of Portland, Oregon, in an article published in 1933 in the *Urologic and Cutaneous Review*. This catheter was manufactured by a mechanical rubber moulder in Portland and distributed by Bard. During the same period, the Anode Company, with the help of Dr. Foley, produced a practical balloon catheter, now known as the 'Foley'. This was published in the *Journal of Urology* in July 1937: 'A self retaining bag catheter for use as an indwelling catheter for constant drainage of the bladder'.

Prior to the advent of prostatectomy the patient was usually condemned to a 'catheter life'. Patients with persistent retention were taught to carry out the procedure themselves. The necessary requisites consisted of a catheter and lubricant, which could be carried in a pocket case, a walking stick or other container: 'Patients carry in their walking sticks or umbrellas but one catheter'. A cabinet of elaborate apparatus was designed for the use of the affluent patient at home. Henry Thompson

referred to two patients, one of whom, aged 90, had been catheterised himself 35 000 times. Even in 1893 Buckston Browne maintained that as long as the catheter life was tolerable to the patient, prostatectomy should not be performed.

The expression 'catheter fever' was first used by Andrew Clark in 1833, to describe episodes of febrile illness in men with prostatic obstruction treated with catheters. One of the earliest descriptions of a systematic approach to reduction of infections due to the indwelling catheter was reported in 1928 by Cuthbert Dukes working at St. Marks Hospital in London. He developed an intermittent irrigation device in which the catheter was attached by a Y tube to a sterile closed drainage bottle. In addition, periodic irrigation with oxycyanide of mercury (1/500) was used to wash the system.

Tidal drainage was originally introduced by Laver but in 1947 was promoted by Munro in Boston. By the periodic filling of the bladder Munro tried to recover the atonic detrusor muscle sufficiently to increase the capacity of a hypertonic bladder.

Since World War II, the majority of centres in the United States practised bladder training with an indwelling catheter and tidal drainage. Over the years however, most of the centres abandoned tidal drainage in favour of other procedures, such as Bors blocking procedures which expedited the return to an upper motor neuron type of bladder. While in the United States bladder training has been performed since 1947, intermittent catheterisation with a 'non-touch' technique was being practised at the Stoke Mandeville Spinal Injuries Centre in England by Ludwig Guttmann. The non-touch technique must be performed by a physician who is surgically scrubbed and dressed; intermittent catheterisation by that technique is performed every 6 h.

In 1958 Paul Beeson published his landmark editorial entitled: 'The case against the catheter'. From 1970 'clean intermittent self catheterisation' was introduced and popularised by Lapides. By this method the patient learned to catheterise him or herself, so that this method could also be

applied without specially trained staff, and could be performed ambulatorily.

In recent years suprapubic drainage began to become popular as an alternative to drainage through a urethral catheter. Routine suprapubic drainage was first done in gynaecological surgery, but was soon extended to general medical patients. The first devices of trocart cystostomy were published in 1966 by Taylor and Nickel, and Hodgkinson and Hodari, followed by the Bonnano suprapubic drainage catheter with a coiled tip. The Cystocath drainage system (Reif design), obtained from Dow Corning Corporation, Midland, Michigan was the first available commercially set.

Today, when a nurse gives a patient a sterile well-packed disposable catheter in plastic or silicone, it is difficult to imagine how comfortable it is, both for the urologist and for the patient. It is good to know and to appreciate how difficult and how painful catheterisation of the bladder was until only a few decades ago.

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2. Some historical aspects of urine recipients and urinals

Although micturition is a normal human function, the collection of urine in a recipient did not occur until relatively late in the history of mankind. Right up to the 19th century, it was customary to simply urinate outdoors somewhere, and this is true of Western civilisation as well as primitive peoples.
Urinating into a recipient was restricted to the aristocracy, or used for medical purposes (uroscopy) only.

1. The first recipients.

Nevertheless, the use of a urine recipient has been described among a number of primitive societies. The Canadian Inuits have their "korvic", which literally means "urine holder". This was in the shape of a bucket and made of sealskin sewn together. (1)
F.W. Beechey, who stayed with the Eskimos in Alaska around 1825, was surprised to observe that they urinated into a recipient in public, amongst everyone in the tent. The urine was collected for tanning skins. (2)
Castenada de Nagera records in his travel journal that the Pueblos and Moquis tribes between Arizona and New Mexico collect their urine in large earthenware jars which they empty outside the village.(3) But these are exeptions among primitive peoples.

2. Urine recipients in antiquity.

Among the Greeks, chamber pots called "amis" were described as used by both adults and children from the 8th century BC onwards. (4) (fig.6)
They were essential during meals and drinking sessions, where according Aristophanes, guests relieved themselves with the assistance of slaves.
Athenaeus records in his Deinosophists XII:"They (the horsemen of the Sybarites) were also the first to invent chamber pots, which they carried to their drinking parties."
"Heliogbalus the Emperor excelled all others in his prodigious Luxury.....his excrements he discharged into Gold vessels, and urinated in Vessels of Onyx, or Myrrhine pots."(5)
But the Romans were the first to use chamber pots, most of which were made of earthenware. They were called *"matula, matella or matellio,* and sometimes *"lasanum."*(6) These recipients are very similar to our chamber pots today. The *"scapium"*, which was shaped more like a sauce boat, was also used, and was a precursor of the later *"bourdaloue"*.
Wealthy Romans had urine recipients of silver and gold, and Roman law even had provisions governing the inheritance of these valuable vessels. (7)
Plinius has described how there were large receptacles in the streets of cities like Rome and Pompeii, into which chamber pots of urine were

emptied. The urine was then collected by fullers. The fermentation of the urine produced ammonia, and this was then used to bleach linen. This continued to be done right up to the late Middle Ages in Europe.

3. The matula and uroscopy.

The oldest receptacle for urine, or urinal, is certainly connected with uroscopy and later developed into the "matula", a recipient specifically designed for the examination of urine.
Although the ancient Greeks and Romans performed uroscopy, the urine was probably collected in earthenware bowls before examination. [fig.7.] Even today, uroscopy is still performed as a diagnostic tool in Tibetan medicine, where the urine is collected in white porcelain bowls. (8)
ISMAEL EL GURIANI, a Persian physician of the 12th century, describes:" The urine needs to be collected in a large, transparent and clean bottle, possibly having the form of a bladder. The form of the receptacle needs to be similar to the form of the bladder so as to ensure that the urine remains in the same natural form."(9)
JOHANNES ACTUARIUS (died 1283) was the first doctor to describe a scientific matula. He was a physician at the court of the Palaeologi and an uroscopist at the Byzantine Court, where he was the last classical physician of the"Greek School". He wrote an important book about uroscopy consisting of 7 volumes: "De Urinis Libri Septem". He divided his urinal into eleven parts. (10)
CONSTANTINUS AFRICANUS (1018-1085) was a Benedictine monk and one of the founders of the School of Salerno. In his book "De Instructione Medici" he describes the ideal receptacle for the urine to be analyzed in: "it must be made of white glass, be clear and transparent, and preferably made of crystal, possibly Venetian crystal."(11)
In 1541, FLETCHER published his work"The Differences, Causes and Judgments of Urine", in which he describes his own matula: "A perfite forme of the urinall, wherein the urine according to its height is divided into three regions for the distinction of the three contents mentioned. 1,2,3,4,: the lowest region for the sediment; 5,6,7,8,: the middle region for the swimme; 9,10, 11, 12,: the uppermost region for the cloud."(12)
In 1548, ROBERT RECORDE published his "Urinal of Physick: "Touching the Urinall, it shoulde be of clere glasse, not thyck nor greene

in colour, without blottes or spottes in it, not flat in the bottom, nor to wyde in the necke, but widest in the myddell and narrow styll toward bothe the endes, lyke the facyon commenly of an egg, or of a very bladder beyng measurably blowen (for the urinal should represent the bladder of a man) and so shall every thyng be sene in his dew place and coloure."(13)
In Europe, from 14th -18th century, the urinal in the form of a bladder, became the medical instrument par excellence. The expression "matula facit medicum" became popular. [fig.8.] The urine became "pars pro toto" in which the whole person was anatomically reflected. The importance attributed to uroscopy by physicians is reflected in many paintings and in the seals of many Societies of Doctors and even Surgeons at that time.(14)

4.The development of urine recipients in Europe.

Archeologic findings confirm the use of earthenware chamber pots from the 13th -14th century onwards. Later, a lead glaze was added to make the material less porous.
From the 15th century onwards, a recipient with a long neck was preferred. From the 17th century onwards, chamber pots were also made of Delftware, and specially made faience, and porcelain chamber pots were imported from China. (15)
There is written evidence of the existence of pewter chamber pots even earlier than 1500 in the Low Countries. They were used primarily in monasteries, convents and hospitals. These pewter pots were handy to use, strongly made from a metal (pewter) which is resistant to acids and salts, and of a design with a low centre of gravity which made it less likely to tip over. This type of chamber pot remained in use right up to the beginning of the 20th century.
From the 17th and 18th century, earthenware and pewter pots were replaced by porcelain versions with elaborate decorations, especially among the higher bourgeoisie. The lower classes had to be satisfied with cheaper models in plain white porcelain.
The *"Bourdaloue"* is a very special porcelain model, long and narrow, with an opening at the top which could be as much as 22 cm. long and 10 cm. wide. It was usually lower in the centre than at the two extremities.

Bourdaloues were usually richly decorated with colourful scenes depicting flowers, birds, landscapes and gallant tableaux. Some are quite frivolous, with an eye or a mirror on the bottom, or a caption "Au plaisir des dames..." (For ladies pleasure) or "A petit coquin je te vois" (Little rascal I see you!)

The name "Bourdaloue" is probably a reference to Louis XIV's priest of the same name (1632-1704), and the confessions he heard from the aristocratic ladies of the court as their father confessor. A position in which he got to the bottom of things, as it were.

But according to Havard's "Dictionnaire de l'Ameublement", the reason why these oval chamber pots were known as "bourdaloues" had a much more physiological origin! Bourdaloue was renowned as an excellent - and lengthy- preacher, and whenever he preached, a huge congregation would gather to hear him. To get a good seat in the church, people had to get there hours in advance. This long wait, and the lenght of the sermon, was too much for many women. They solved the problem by bringing along this little chamber pot concealed under their skirts, so that if the need to urinate became too urgent, they could do so right there, without leaving their places.

However, a more scientifically sound explanation is that his name was given to a great many things, often satirically, both during his life and after. The fact that the earliest written reference to a *"bourdaloue"* in the sense of a chamber pot dates from 1742, supports this explanation.

The beauty of the bourdaloues sometimes led to some confusion, as we can see from the letter Mme.de Deffand sent to her friend Mme.de Choiseul on 9 May 1768:"My dear friend, I must tell you and the Reverend Father of my great astonishment yesterday morning, when a large bag was brought to my bedside from you. I made haste to open it, and found not only the first peas of the season, but also a bowl. What could this be? I opened the parcel quickly and see: it is a chamber pot. But a chamber pot of such beauty and charm that everyone here was unanimous that we should use it as a sauce boat instead. I put it out on display the whole evening, and it was greatly admired..."

A similar story about urine recipients used during long church services is told about the "Kuttrolf" in Germany (see below).

But the top was undoubtedly the silver chamber pot. This was only found in the very best circles, and few have survived today. In view of the price

of silver, most of them have been melted down to make other things. The most famous silver chamber pots still preserved today are one made in The Hague in the Netherlands in 1678, and the oldest known English silver chamber pot made in 1670 in York.
Louis XIV also had a silver pot bearing his coat of arms.
"The emperor" was the Regimental nickname for the silver chamber pot belonging to Joseph Bonaparte, King of Spain, and captured by the 14th (King's) Hussars at the battle of Vittoria, 21 June 1813. It is still in the hands of the 14th / 20th (King's) Hussars, who are consequently known as "The Emperors Chambermaids"! (16)
Queen Elisabeth I of England used a golden chamber pot!

A substantial earthenware chamber pot industry grew up in North Staffordshire, in England.
From the 14th -19th century, a chamber pot was referred to as a *"Jordan"*, a name which was only used in Britain. Two names appear more or less simultaneously in the 14th century: the English term *"judies, Jordan"* and *"Jordan"*, and the Latin *"Jordan's"*. One Latin text speaks of a *"urinal"*, while another writes of *"duae ollae, quas jordanes vulgo vocamus"*.
From the 19th century onwards, the name *"chamber pot"*came into general use. (17)

5. Urinals in glass

Urinals are also made of glass, and the most well-known is the "matula". Although it is very fragile, glass is used because it is easy to clean.
There is still some controversy over weather or not the *"Kuttrolf"* or *"Angster"* (from the Latin angustus, meaning "narrow") was also used as a recipient for urine.
A Kuttrolf is a glass recipient that has a cup-like wide pinched mouth or upper container, joined to a globular body by a neck composed of 3 to 5 intertwined thin tubes, so that when the liquid is poured from the body, it flows only drop by drop, which reduces the bubbling or gurgling sound.[Fig.9.]
The name has been said to derive from *"Kuttering"* (gurgling) or from the Latin gutta (drop) or gutturnium (a slow-pouring dropper for

perfume). The Kuttrolf was popular in the 16th and 17th centuries. Because a lot of upper containers of Kuttrolfs are inclined and have an oval form, some people have concluded that they were used as recipients for urine, especially by woman attending the long masses and other Christian ceremonies of the times. In an article in Therapia Hungarica, is stated that the Kuttrolf is a urinal for woman. The Grimm dictionary (1873) also mentions old poems where the Kuttrolf is used as a urinal!
A variation of the Kuttrolf is a tall single-tube flask with a thin curving neck, made in Persia in the 18th and 19th centuries, and used as a rose-water sprinkler. Here again the tall, thin and vertical attenuated neck, to provide slow pouring and to prevent the noise of bubbling insinuates that they have been used as urinals for woman, although we did not find any source that confirms this use.

In cases of total urinary incontinence a glass bottle or a pig bladder was attached to a belt as a recipient as it is beautifully illustrated in 1683 by Fabricius Hildanus in his book:"De Ardore et Incontinentia Urinae, et nova Inventione Instrumenti, quo inter deambulandum colligitur. Observatio LV."

6.Curious urinals for babies in Turkestan.

Some curious exhibits and diaries can be seen in the "Museum für Völkerkunde" in Vienna (Austria). They were brought back by Austrian Prisoners of War who were interned in Turkistan after their battles with Russia in World War I.
In his diary Frans Heger (1853 - 1931) writes: "On the market I bought a small and deep vessel, glazed inside. This is a chamber pot for children, and is fixed at the lower side of a cradle. I bought also two Piss apparatus, one for girls and one for boys."(18)
What this apparatus means is beautifully described by Fritz Willfort: "Many of our soldiers had lost the pipes they had brought from home, and this article was not for sale at this place, because neither the Russian nor the local people smoke pipes. But we and the soldiers found what we were looking for in the Bazaars of the Sarthtic and Kirgiz people! A lot of wooden, simple.... curious things, with a straight, perforated wooden stem and a short part, about five centimetres long and a second part with

a diameter of two centimetres. Both parts brought together looked like something resembling a pipe. On the other part, and as great in numbers we found in the same manufacturers other wooden equipment similar to the first type, but composed only of by the straight, perforated round wooden piece, whereby the upper part had a trough-like incision of five to six centimetres long and one a half centimetres wide.[Fig.10] When our soldiers and ourselves showed great interest in these objects, all merchants and spectators started to laugh loudly, which laughter increased even more when the soldiers demonstrated how you could smoke with these "pipes"! At the beginning we were astonished, but we obtained soon the explanation for this hilarity. What we wanted to use as a pipe, was what the local women used to keep male babies dry, putting the penis into the short transverse part and the vertical part into a vessel in the bottom of the cradle! [Fig.11] Together with a towel looped double around the bottom, this enables the Sarthtic or Kirgiz mothers to keep their babies completely dry. The other kind of wooden equipment was used for girls."(18)
Some years ago we still found, and could buy these wooden urological instruments on the market in Samarqand (Uzbekistan) in 2000 and even in Georgia in 2002 (Tbilisi).

A lot could be said on Japanese urine recipients, the English custom to give a chamber pot as a marriage gift and the Sunderland ware frog pot. This latter was made to amuse with the liquid creating a glugging sound as it passed the frog in a mug!

Remembering the past, the actual view of the plastic urinals in my own urological department gives my only a glimpse of the glorious history of urinals and urine recipients!

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Illustrations.

Fig.1. In mediaeval times, and even in the Renaissance, catheterisation was done in the upright, kneeling or sitting position. (Heinrich Kullmaurer and Albrecht Meher – 16th century)

Fig.2. Mercier's coudé and bicoudé catheters

Fig.3. Auguste Nélaton (1807-1873), the father of the red rubber catheter. (Litho Lafosse 1865)

Fig.4. Nelaton's straight rubber catheter as it appeared in an early Eynard catalogue.

Fig.5. Reynard published in 1853 the first rubber self retaining Catheter with inflatable balloon

Fig.6. Greek urine recipient for children in terra cotta (8th century BC)

Fig.7. The matula used for medical diagnostic was probably the oldest urine recipient

Fig.8. *Matula facit medicum:* the importance attributed to uroscopy by physicians is reflected in the seal of the surgeons and pharmacists in Oudenaarde (Belgium) – *Societas SS. Cosme et Damian. Aldenarde.*

Fig.9. A Kuttrolf is a glass recipient that has a cup-like wide, pinched mouth, which is joined to a globular body by e neck, composed of 3-5 thin intertwined tubes such that when the liquid is poured from or into the body it flows only drop by drop, which reduces the bubbling or gurgling sound.

Fig.10. The "pipes" that the Austrian prisoners of war found at the bazaars of the Sarthic and Kirgiz people in Turkistan are used as urinary device for babies.

Fig.11. A typical Georgian cradle with a hole in the middle for passage of the urinary device for babies.

Fig. 1

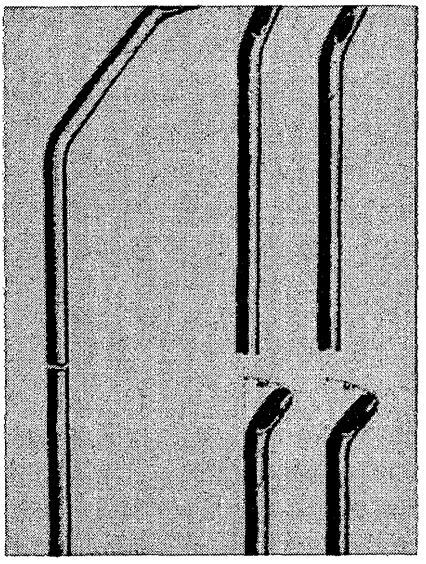


Fig. 2

Fig. 3

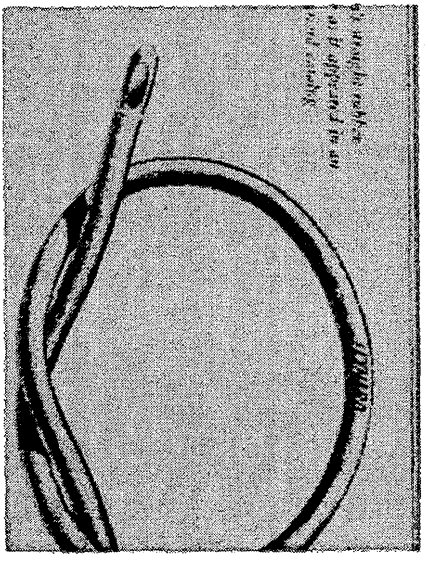


Fig. 4

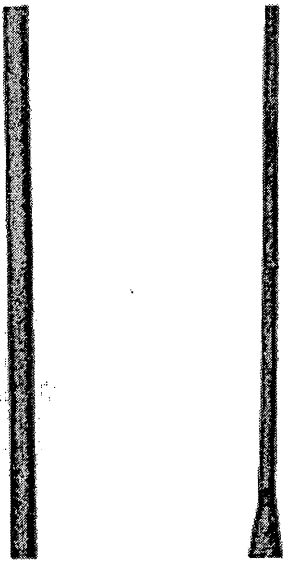
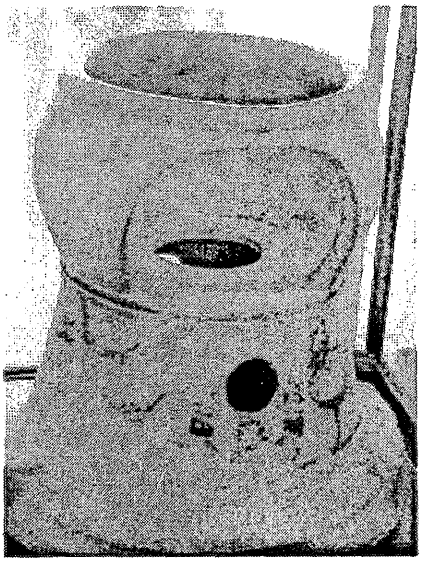


Fig. 5



Fig; 6

Fig. 7

Fig. 8

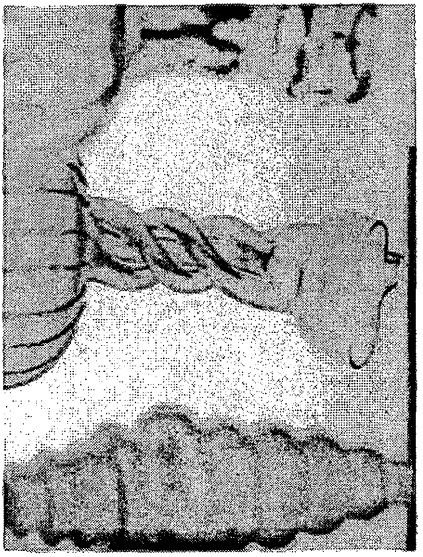


Fig. 9

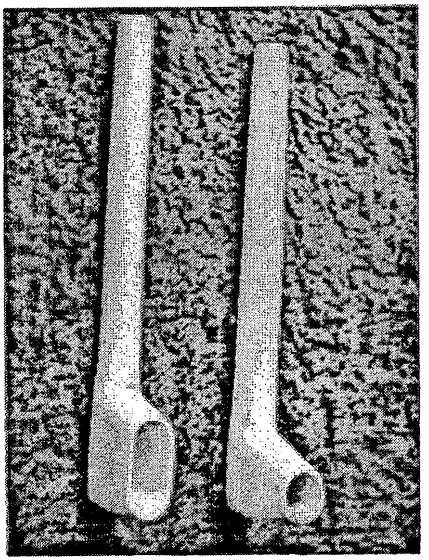


Fig. 10

Fig. 11

LAUDATIO JACQUES CARPAY

Marc Spoelders

Jacques A.M. Carpay's formation at the University of Amsterdam included, next to Psychology and Education, General Linguistics and Slavonic Studies. His mentors in the latter domains were Reichling and Jakobson (and/or their disciples) who brougth him, from the beginning of his university studies onwards, in intense contact with the complex problem of meaning,its intersubjective creation, and the investigation of the mechanisms which are at the root of it. In this respect Jacobson's approach led Carpay via Peirce's ideas to the work of Vygotskii and Bachtin which, also, focused on the dialogical nature of thinking. In these approaches thinking is conceived of as a form of internal speech. *Ergo*, an emppty head does not think and thinking always is a kind of conversation with a real or a virtual partner.

Subsequently, the theme of internal speech guided Carpay to the investigation of the genres of argumentation and reasoning in the context of formal and informal learning, in and out of schools. Hence Carpay's interest in the intrinsic relationship between components of language mastery and cognitive and social functioning and participaton of man in a variety of social contexts. At the beginning his research followed a psychological line of approach. Through the works of Bachtin, Bernstein, Bourdieu, and Foucault sociological, *viz.* socio-cultural points of view were integrated. This resulted in a broad spectrum investigation of the causes of failure at school, *viz.* the conditions for enhancing the outcomes of formal and informal learning.

With this spiritual legacy he entered the (roaring) sixties. From that period onwards Carpay has devoted himself to interdisciplinary research into the learning of children and youngsters in basic education (4-16 years) from an emancipatory viewpoint, inspired by Dewey* and Vigotskii. Their view of the relationship between instructional

pscyhology, on the one hand, and learning, language and cognitive psychology, on the other, served him as a line of action for education.

From his retirement onwards he has mainly been occupied with socio-cultural, (second order) research of the conditions, *viz.* psychological or sociological bottlenecks which inhibit attempts to 'lift up' people living in the margin of society. For leading and being led are no longer evident in the control over turn taking in society. Hence the discomfort concerning a science- *viz.* élite- dominated order of thinking, speaking, do's and don'ts in our ICT society, is at the heart of his research.
In terms of Aristotle's idea of democracy it is Carpay's conviction that it all boils down to the problem of leading and being led, and to the distinction between facts and opinions. In other words it has to do with the distinction between, on the one hand, the nature of the answer to a question and, on the other hand, the answer to the question whether the anwer is to one's liking. In short: how should the control over speaking be organised when anyone may join in?
Or more specifically, which self image should the future élite have in a society which has evolved from a command household to a negotiated, polyphonic one?

The question of who has a say over (and of) the order of thinking, speaking and doing - as meant above, and its embedded question of the self image of the talking professions, leads to a new view on the formation of future citizens in general, and of intellectuals more in particular. The delicate subject of the nature of knowledge and, especially, how it should be dealt with in the varied echelons of society is of great importance at this juncture. For the terms of top-down and bottom-up thinking moves in conversational interactions have to be regauged. This has to be done in a context in which the spoken word predominates the written word. Hence, according to Carpay, learning by doing needs to be replaced by learning by taking part in. However, how can we remain on speaking terms when a bird is known by its note, and a man by his talk?

In line with Dr George Sarton, Jacques Carpay is in search of a new humanism, he has a synthesising mind, and is able to open a person's

eyes. He stands on the shoulders of his predecessors, drawing from the *fons perennis* of his discipline. Thus, as Chair of the Comenius Foundation he tries to harmonise the universal insights offered by this great educationist with the variety of present (eduational) thought, speech and action.

The scientific oeuvre of Emeritus Professor Carpay shows that there is a single ('A1') road map for academic success. In order for the human sciences in general, and educational sciences more in particular, to survive academically, keep their originality and creativity, routings marked in a format only suitable for the positive sciences will not suffice. Indeed, for 'A1' unreachable or unsuited territories having high educational potential will then no longer be investigated nor scientifically mapped.

A meaningful scientific and academic activity in the educational province which is not tributary to improper output criteria is not only possible – as Jacques Carpays' work bears witness of- but, indeed, highly needed, not in the least in light of the responsibility for the education of future citizens.

Bio-bibliographical note

J.A.M. Carpay (1933) studied at the University of Amsterdam (Linguistics, Slavonic Studies, Psychology and Education) . After having been a part-time teacher and school counselor (1955-1969) he became a collaborator of Professor C. van Parreren at the Psychological Laboratory of the Universtiy of Utrecht (1969-1977). In 1975 he obtained a PhD in Social sciences (University of Utrecht). From 1977 till 1993 he was professor of education at the Free University Amsterdam. Emeritus Carpay remains active internationally through guest-professorships and invited lectures at congresses. He is chairing the Comenius Foundation (Naarden, the Netherlands).
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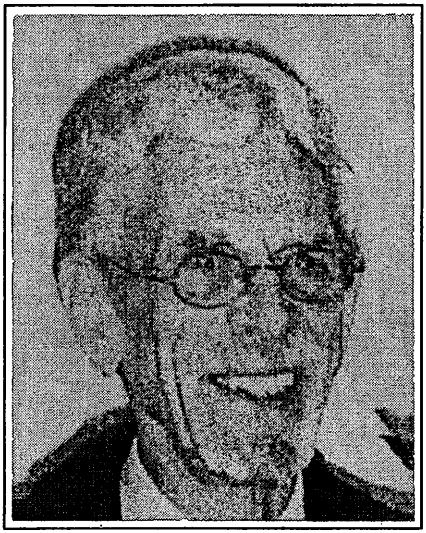
*In *I knew a phoenix. Sketches for an autobiography*, Dr George Sarton's daughter, the world- famous writer May Sarton decribes vividly her experiences at Shady Hill, a Dewey inspired school in Cambridge, Mass. I bought this brilliant book in 1984, while staying at the Harvard Ed.-School, after having visited George Sarton's former office in the Widener Library. During one of Jacques' stays at the Department of Education– where he lectured on Dewey- I loaned the novel to Jacques. It started up a discussion on George Sarton and his work which resulted in Jacques' nomination, many years later, as a Sarton-medallist by the Faculty of Psychology and Educational sciences.



THE THEORY-PRACTICE[1] PROBLEM IN EDUCATIONAL SCIENCE

Jacques Carpay

For with the judgment you pronounce
you will be judged,
and the measure you give
will be the measure you get.
Matthew 7:2

According to Freud there are three impossible professions: educating, healing and governing. These three core institutions (1) have a long history, (2) are universal, (3) are multifaceted, and (4) are valued in a variety of ways. This state of affairs is reminiscent of what Churchill is supposed to have said of the Balkans: that the people there were confronted with more history than they can cope with. These words could equally apply to the public debate on the ins and outs of these three core institutions.

Educating, healing and governing are common "goods," so there also will be "ills." People are continually concerned about proper order in society. In this respect, they regularly ask themselves whether the management of the respective institutions is in good hands. This occasionally results in a struggle for meaning with multi-voicedness and the taking of distinct positions as its main characteristics. Secondly, this struggle for power is a constant phenomenon throughout history. A third critical trait is the use of the words "old" and "new." Time and again, we reach the stage when the old institutions have had their day, and have to make way for new ones. Then the long march through the institutions begins. Regarding the latest crusade through the educational province (Nota Bene, the expression is Goethe's), we still have a long way to go.

The question arises whether everything that is labeled "new," actually is "new." This applies not only to material objects, but also to concepts and worldviews and notably to the ways those are valued. According to the Dutch novelist Couperus, it is not only things that pass, but also people.

Yesterday's newspaper contains only "old" news. Time and tide wait for no man. This conventional wisdom relating to the transience of all manner of things leads to the question of which concepts of education are outdated, and which are old but not yet outdated. In other words, which pleas for school reform are currently – and rightly – subject to criticism, and on what grounds? The point of departure for my present argument is based on two recent events. I am here referring to the remarkable interest within the pedagogical province for the French movie *Être et avoir*, and the appearance of the term "new learning."[1] Before elaborating this argument I would like to note that, in both cases, the discussion differs on where priorities should lie. Should the curricular and organizational dimensions of a concept of education take priority, or the pedagogic dimension?

The denotations and connotations relating to *Être et avoir* and the appearance of the term "new learning" caused me think. I regard both events as writing on the wall. Whenever a new term comes into being, it always occurs to reflect a new need. For instance the term "air pollution" only came into fashion, when we realized that clean air is no longer a matter of fact. A revealed shortcoming calls for action. The massive interest in *Être et avoir* is, in my view, a symptom of the epidemic that is currently raging in the pedagogical province. I use the term "epidemic" as a metaphor in the spirit of Freud. According to him, it is not only people who can suffer from serious disease, but also institutions. He wrote about the widespread discontent with the culture of his time. He wanted to transform this mind-set into its opposite.

Être et avoir depicts an idyll in which a schoolmaster is wrestling with the standards of the teaching profession. In Monsieur Lopez and his one-man school in Auvergne, we recognize an idealized version of a primary school. Lopez pays no attention to the regulations drawn up in Paris and, lo and behold, he and his students are happy. Books have a moral, and so

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1. The term "new learning" is recently introduced in The Netherlands as an overarching concept. Under this heading traditional didactic instruction with its teacher-posed question and answer duplets is strongly rejected. Instead there is a strong preference for hands-on and project-style activities.

do movies. Here, the moral is addressed at the Ministry of Education. Additionally, the message in this case is twofold. In the first place, the movie points out that the quality of the pedagogical relationship in the classroom is a significant source of variance in explaining successful and failed learning. In other words, the master's eye makes the horses fat. The well being of the students and their curiosity for learning depends to a large extent on the way in which the teacher is able to make the dead letter of the course book come alive. Knowledge must be anchored in the student's personal repertoire, as Spinoza already contended. In short, the teacher must attune the language of the mind to the language of the heart. Monsieur Lopez has apparently taken this Augustinian philosophy of education to heart. He believes that quality is more important than quantity. Moreover, he wants to avoid a situation in which he has finished the course book at the end of the year, but the students have not. The inspector wants more, Lopez wants better. Just like the Dutch educationalist Jan Ligthart, he is a passionate advocate of the '*pedagogy of the heart*'[2]. This child-centered approach evidently appeals especially to the pedagogically minded. Lopez resists drilling his students towards the final examination. He prefers adaptive education, i.e. education at "knee-height." Here lies the movie's second message. Lopez follows his own plan. He himself, not Paris, sets the educational standards that really count, and moreover he determines how the quality requirements should be assessed.

Monsieur Lopez is a hero of our time, because when he talks about his students, he speaks in an other voice than the educational managers do. Lopez does not believe in "Sunday-like" pedagogy in which the emergence and measurability of learning outcomes is an axiom. Lopez is only interested in weekday pedagogy. In his philosophy, practical objections and legislation stand in the way of school reform. For Lopez, curiosity is more important than learning outcomes and the number of students admitted to secondary education.

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2. Nota Bene, Jan Ligthart uses this term to refer to Pestalozzi's three-step "hand-head-heart" approach. A student can, for example, count with the aid of his fingers, count by thinking aloud, or "by heart'," i.e. without any external aid.

We can categorize the story of Lopez as that of a practitioner. However, Lopez has a theory as well. Some social scientists refer to this theory as "a practice-bound theory." Lopez' mind set apparently appeals to many people, and the high audience attendance at *Être et avoir* are the resounding proof. I am inclined to take Lopez' position seriously. But I am not prepared to claim that his pedagogy can be valued as a "best practice."

The time when the majority of the students receive no more than a primary-school education is definitely over. Today, in The Netherlands, all children attend school for at least four years after primary school. During this period, they must appropriate a wide variety of cognitive, communicative and social skills, along with the connected intellectual and moral virtues. The requirements that used to be placed upon only a proportion of adolescents have now become common goals for all young people. This implies that the familiar primary-school subjects are now taught in a different format. Additionally, new syllabuses have been introduced to the primary-school curriculum. In particular, there have been major changes in the selection and sequencing of curriculum content for geography (social studies), physics, history and the arts. The new curricula for mathematics and first language teaching even bear no resemblance to those of the past. Lastly, in The Netherlands, teaching English is now also compulsory in primary education. I see no reference to all these new requirements in the concept of education of Monsieur Lopez. Moreover, there is the thorny issue whether he actually wants to receive further teacher training.

In order to become familiar with a new curriculum, the teacher must put himself in the position of a *student*. Initially, any new curriculum actually is a course book for the teacher. He must, for example, learn to think differently about the orchestration of educational discourse in the classroom. A small part of further teacher learning involves additive learning, but the main part of it amounts to unlearning. This applies particularly if the new curriculum is designed as an alternative to the familiar recitation script. Studies of how new curricula usually are chosen, and above all studies of the teachers' in-service training that follows – individually and collectively - during the first three years after the introduction of a new curriculum, reveal that the teachers involved are mainly hampered by old habits. They are inclined to use the new curriculum in the old way, al-

though this occurs less often when supervision and coaching at the school level are provided during the implementation phase. I shall return to this thorny issue further on.

Thus far, with the story of Monsieur Lopez, I have referred to only one voice of the many in the public debate with respect to the issue of "new learning." However, I would emphasize that complaints in the spirit of Lopez nowadays are heard not only among teachers, but also among parents. In fact, both groups oppose the pressure to perform that is inbuilt in the new core objectives of primary education. These core objectives, they argue, are no longer in line with the existential needs and wants of contemporary students. Neither are they in line with those of teachers. I hasten to add that this heartfelt cry is far from new, as is evident from the many references that can be found in the *belles-lettres* as well as in the educational literature. In this context, the word "new" can at best only be applied to the slogans propagated by the sponsors of post-modern pedagogy. Two striking examples in The Netherlands are the schools that agree to the pedagogy of the Polish physician Janusz Korczak, and the so-called '*Iederwijs*' schools[3]. Both current concepts of education have fully embraced a post-modern pedagogy, allowing the students to choose what they want to learn and how they want to learn it. A post-modern restaurant has no menu; Korczak-inspired schools and *Iederwijs* schools have no syllabus.

It is tempting to devote the space allotted here to analyzing and commenting on the pedagogy of the Korczak-inspired and Iederwijs schools. Admittedly, their proponents make an important point with their argument against burdening children to early and too emphatically with learning tasks that are important in a world where life amounts to fierce competition and where lack of time has become a status symbol. Unfortunately, Carl Rogers' *Freedom to Learn* remains a utopia for schools.[4] Schools

3. The so-called 'Iederwijs' schools are inspired by the American Sudbury Valley School (www.sudval.org). In Dutch the compound word "Iederwijs" refers to a natural striving in all children to become "universally wise." Regarding the Korczak-inspired schools for brevity's sake I refer to www.korczak.org.uk.
4. C.R. Rogers (1969), *Freedom to Learn*. Columbus, Ohio: Merrill.

alone cannot heal society's ills. Additionally, schools are not permitted simply to dance to the tune of all kinds of interest groups. A second important point in this context relates to the question of whether the adult world should be protected from the unbridled urge for renewal of the younger generations. As Lafontaine once aptly remarked, young people do not compromise: "*cet âge n'a pas de pitié*". In short, without teacher guidance and social support, it appears very unlikely that all children will learn. Therefore, my advice to the *Iederwijzers* (as teachers in these schools are called) is to listen closely to the students themselves. I myself got wise in the 1970s, when I overheard a girl in a progressive primary school ask her teacher whether she could do the group task on her own. We can dispense with authority, but we cannot do away with the need for it.

The dissenting voices I have mentioned so far can be heard at the margins – or the boundaries, if you prefer – of the pedagogical province. The people in this realm usually rely on seers rather than thinkers. But there also is a second camp that accommodates people who rely on the work of educators rather than seers. From this position they regularly launch crusades in an attempt to convert the conservatives in the pedagogical province. With this assertion, I arrived at the argument of the proponents of new learning.

Before I discuss the main characteristics of this echelon, I would like to point out that all the advocates of "new learning" appear to be employed in the school support sector. None of them are teachers in a primary or secondary school. We could also refer to this echelon as "theorists," provided the term is interpreted not in a pejorative sense, but as a description of the main activity of the professionals concerned. Based on a quick survey of the Dutch literature concerned, I discovered that all the proponents of "new learning" are either teacher trainers, curriculum developers within some organization, or counselors in one of the many agencies within the school support sector.

Naturally, I had a good reason for carrying out this survey with respect to the background of the authors involved. As a downright school watcher, I already had noticed that in the last decade a radical shift has taken place in the domain of educational research. In The Netherlands the majority of

researchers have moved – voluntarily or otherwise – from university-based positions to appointments in the school support sector. Time will reveal whether this new positioning of educational researchers will indeed have rendered schools into *learning organizations*. In any case, one thing is certain: teachers will have to move with the times. Just like dentists and physicians, for example, they will have to undergo further teacher training on a regular basis. The question that arises is how. On the one hand there is nowadays pressure from parents who are searching for a school for "our type of people." On the other hand, all schools are wrestling with the thorny issue of how to formulate their mission statement. A choice in favor of a wide range of alternatives for parents to choose from has its advantages, but the question arises how concepts of education should be stated, justified and above all financed.

The increasing number of pleas in favor of "new learning"makes one thing clear. Traditional didactic teaching has had its day. Classroom talk must be orchestrated differently. It should be based on hands-on and project-like activities. A second requirement in the context of school reform concerns the provision of curricula that aim at a wide range of competencies. Whether we like it or not, the demands placed on future citizens have become more complex. Therefore, more students will have to appropriate skills and attitudes that in the past were required only for a restricted category of students. Put simply, how do we transform schools into a *workplace* in the spirit of John Dewey, where the students learn by taking a substantive part in an embryonic community of inquiry?

So far I voiced in headlines the argument of the advocates of new learning. Apparently, their approach is based on a variety of *learning theories* that underlie cognitive constructivism. The proclaimed aim is to develop positive dispositions toward teaching practices that encourage exploration, collaboration, and individual student responsibility. Nurturing a love for learning and an excitement towards learning through guided discovery are also goals. The theories span intersubjectivity and scaffolding from Vygotsky, individual responsibility for learning, and assimilation and accommodation of ideas to allow for individual construction of knowledge from Piaget. Project work is also included, as well as the application of the emergent social construction of knowledge in the spirit of Dewey.

Lastly, there is also reference to the notion of multiple intelligence from Gardner.

Those who know my work now no doubt expect me to praise the advocates of new learning, given the theoretical framework that Van Parreren and I introduced in 1960s for the school reform that was under construction at that time. However, I will not do that, and for two reasons. First, I am of the opinion that the proponents of "new learning" think about successful and failed learning from at least two different perspectives. In the vein of Piaget, some of them actually advocate *learning-alone-together*, while others in the footsteps of Dewey and Vygotsky focus on learning *in a team setting*, in which teacher and fellow students each make their own specific individual contributions.

In terms of De Groot's famous work *Vijven en zessen* (Fives and Sixes), we have in the first case a "cross-country model", and in the second case an "expedition model": "out together, home together."[5] For pedagogical reasons I have always opposed the cross-country-model. That is why I have never been a supporter of the Montessori and Dalton pedagogies. I have well-founded objections to both these approaches, and in fact I am against all forms of learning based exclusively on individually prescribed curricula. Curriculum content is not transferable until it has functioned in a classroom discourse between the teacher and students, as well as among the students themselves. Students should regularly rotate in the role of teacher and of student so that they can learn to regulate and monitor each other's approach to the learning task involved. The majority of proponents of "new learning" lack this focus on peer learning in appropriating the curriculum content involved. In my view of "new learning," a Dewey-Vygotsky-inspired approach has a double benefit. A teacher cannot monitor all students simultaneously, although this is necessary. If the teacher's and the student's role rotate, the students can learn by means of group

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5. Cf. A.D. de Groot, (1966), *Vijven en zessen. [Fives and Sixes] Cijfers en beslissingen: het selectieproces in ons onderwijs.* [Grades and Decisions: the Selection Process in the Dutch School System] Groningen: J.B. Wolters. See also J.A.M. Carpay (1979), *Over leerlingen gesproken.* [A talk on students] Inaugural lecture, Free University, Amsterdam.

tasks to keep to the rules exemplified by the teacher. By providing more group tasks with built-in guidelines for study, students will appropriate more effectively their role than when classroom talk only is followed by individual seatwork or by work in small groups in which certain students always take the teacher's role, leaving others to take on the student's role. According to Aristotle, democracy is a matter of leading as well as being led. Viewed from this perspective, I think it is wise to allow the students in schools systematically to acquire experience, in the teacher's as well as the learner's role. Learning to collaborate in a team setting has rightly been declared a core objective of preadolescent education.

The topic of peer learning in a community of inquiry – or of learners – brings me to my second objection to the proponents of "new learning." Most of the arguments I have studied lack the necessary knowledge of the literature produced in the vein of Dewey, Vygotsky and in The Netherlands of Kohnstamm.[6] For example, I not only miss references to Gal'perin and Davydov, but also to European and American educators who have carried out school-bound research in the spirit of Vygotsky, Dewey or Kohnstamm. I suspect that this is due to what Piaget once referred to as '*la maladie Américaine*', namely the tendency to look at only the most recent literature. I fear that this practice has taken root in The Netherlands, too. However, something that bears the label "new" is not necessarily "new'." I condemn the practice of not quoting in full. There is one Bible, but many different interpretations to debate. In a historical and contemporary context, the way one reads a text always varies. A book is not a book until the reader opens it. The same holds true of concepts of education. We can study them from a generic or from a genetic point of view. In this respect I make a further distinction between a top-down and a bottom-up approach. The former was sponsored by William James in his famous book *Talks to Teachers on Psychology*. John Dewey and Lev

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6. For the *relationship* between the approaches of Dewey, Vygotsky and Kohnstamm, see my two articles: J.A.M. Carpay (1996), "Learners' appraisals do count. A critical case study", in *Scientia Paedagogica Experimentalis 33, nr. 1*, 79-106. J.A.M. Carpay (1996), "A school for future citizens", in *Scientia Paedagogica Experimentalis 33, nr. 2*, 147-170.

Vygotsky introduced the latter approach.[7] Both scholars actually advocated talks *with* teachers rather than talks *to* teachers. Therefore, I would advocate establishing *study groups* of theorists and practitioners. In such networks the participants exchange their experiences with a certain curriculum on a regular basis by means of a logbook. In my view, real or virtual study groups are necessary in order to ensure that a new curriculum can function properly, that is, in accordance with the objectives of its sponsors. As Newton once aptly remarked "all scientists stand on the shoulders of giants." Good teachers also build on the work of their predecessors.

I would like to devote the rest of this talk to explore the issue of "new learning" in more detail on the basis of my own experiences with reading comprehension and project-like work in Dutch middle schools. Until recently, neither of these subjects had been developed at full at the primary school level. My research reveals that the design (theory) and the implementation (practice) in pre- and in-service training can be seamlessly linked, provided the teachers are first familiarized with the "student track" that, in most curricula, is usually only delineated in the singular (N=1). Teachers should not move from the "student track" to the "teacher track" until they are familiar with the co-ordinates of the various learning trajectories that the students ($N \geq 3$) actually follow in order to reach their goal. *Magister a puero discit*: the teacher learns what he must do from his students. These words by Seneca were formally engraved above the entrance to the Rousseau Institute in Geneva. Teachers must learn to shape the learning process in close co-operation with small groups of students. The more we teach, the less they learn, as Comenius wrote in his *Magna Didactica* (1657). The "new learning" that is currently being promoted rightly emphasizes *heuristic* education, that is, forms of teaching whereby teacher and students construct knowledge together. However, this teaching-learning strategy has yet not been developed satisfactorily from a pedagogical perspective.

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7. See W.J. James, (1899) *Talks to Teachers on Psychology*. New York: H. Holt. For my argument in favor of 'talks with teachers', see J.A.M. Carpay (2002): "The presence of the Past: Talks with teachers on Dewey and Vygotsky", in *Scientia Paedagogica Experimentalis, 30*, no. 2, p 133-152.

Finally I would like to comment, in this context, that "new learning" still focuses too heavily on the principle that every teacher must design his or her own curriculum. I would only wish to advocate this approach for those from the field of educational science who, together with teachers, develop and test *new* curricula. My second objection is that curriculum developers are inclined to restrict themselves chiefly to the cognitive domain. The affective domain is not sufficiently dealt with. Additionally, the majority of developers tend to ignore the rules for class-management, which shape the pedagogical environment. In this respect, many new curricula leave teachers in the lurch. The heterogeneous school population in today's schools is unmanageable if teachers are unable to achieve unity in diversity. The authors of curricula will therefore have to pay greater attention to the issue of *individualization*, that is, recognizing the signals given by various categories of students when they encounter difficulties in their learning process[8]. Sometimes the students require academic help, sometimes social support. The fact that fellow students often understand these signals better than the educators should make teachers stop and think. Sometimes the practitioners (in this case the students) are ahead of the theorists (the educators). In this case, the blind will have to lead the lame.

So far on my argument regarding the issue of "new learning." I have attempted to give a brief guided tour in which classroom-bound learning came to the fore from two different points of view. For the purpose of the current discussion I chose two extreme positions, namely the perspective of the radical "practitioners" and that of the radical "theorists." Mindful

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8. In my "Talks with teachers," I distinguish between three layers (or loops) in the argumentation concerned. 1. Aims and objectives as articulated in an old or a new *syllabus*. 2. Pedagogical approaches as delineated in the respective *curricula* or *guidelines*. 3. Forms of *individualization* (or participatory structures) conceived of as a variety of measures to be taken into consideration in order to accommodate the students' uniqueness. In practice this triple loop approach has proved to be an appropriate format for managing talks with teachers in the context of in-service teacher training. See further: J.A.M. Carpay (2001), Towards mutual understanding in the classroom. In *Scientia Paedagogica Experimentalis 38*, 1, 3-16.

of the scholar after whom this chair is named, the historian of science George Sarton, I looked at the past from the point of view of the present. I then attempted to project several paths from the present into the future. In the course of this quest I have voiced a number of doubts. Consequently, I have advocated a more moderate approach in certain areas. Of course, the theorists must keep the conversation with the practitioners going. However, I see no point in anacademic debate between the two echelons because basic pedagogical assumptions and educational principles can only be endorsed or rejected. Better results would be achieved by a study group that is engaged on schoollevel in an ongoing discussion in a team setting, and considers the issues concerned from the maker's as well as the user's perspective. This would encourage all parties concerned to make their own contribution. If I understand it well, this actually also is the intention of the proponents of "new learning". Experiences with learning to use the computer support this claim. The spread of the PC did not come about through a formal learning process, but through an *informal* learning process in which the participants involved sometimes figure as teachers, sometimes as students. In Cicero's words: "Through doubt, we arrive at the truth".

LAUDATIO BERND VOLLMERHAUS

Paul Simoens

Mit Prof. em. Dr. Bernd Vollmerhaus als Preisträger der Sarton-Medaille 2005 hat die Veterinärmedizinische Fakultät der Universität Gent nicht nur einen hervorragenden Anatomen und international höchstgeachteten Wissenschaftler, sondern auch einen engagierten Medizinhistoriker und einen ausgezeichneten Fachautor vorgeschlagen. Durch seine umfassenden Kenntnisse, kombiniert mit lebenslanger intensiver Lehrtätigkeit, feinsinnigem Humor und persönlicher Bescheidenheit hat er als Forscher und Didaktiker seine zahllosen Studenten, Mitarbeiter und Kollegen begeistert und beeindruckt.

Bernd Vollmerhaus wurde am 22. Oktober 1927 in Lüdenscheid (Westfalen) geboren. Seine Liebe zur Natur und den Tieren veranlaßten ihn, eine landwirtschaftliche Lehre anzutreten, und 1949/50 immatrikulierte er an der Justus-Liebig-Hochschule für Bodenkultur und Veterinärmedizin in Gießen. Dort schloß er 1955 die Tierärztliche Prüfung ab und wurde 1957 promoviert.

Aus seiner im Jahr 1954 geschlossenen Ehe mit Frau Christel Vollmerhaus, geb. Schulte, wurden zwei Töchter und zwei Söhne geboren.

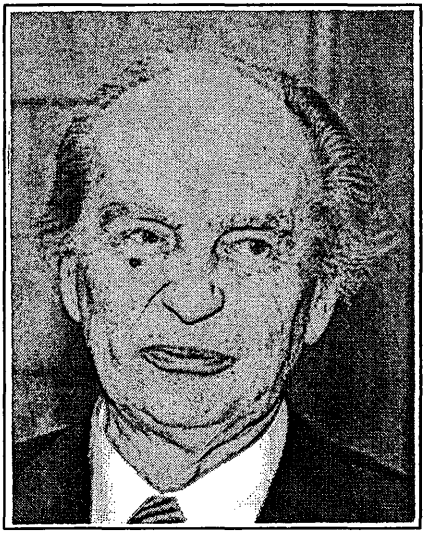
Die Universitätslaufbahn von Professor Vollmerhaus begann 1956 als wissenschaftlicher Assistent am Veterinäranatomischen Institut der Universität Gießen unter Prof. Dr. A Schummer. Die Veterinärmedizinische Fakultät Gießen erteilte ihm im Jahr 1963 die *Venia legendi* für das Fach „Anatomie, Histologie und Embryologie der Haustiere". Vier Jahre später wurde er zum ordentlichen Professor für Makroskopische Anatomie der Tiere an der Ludwig-Maximilians-Universität München ernannt. Die Leitung und der Auf- und Ausbau des gleichnamigen Instituts wurden ihm drei Jahrzehnte lang anvertraut. Aber nicht nur diesem Auftrag galt sein ganzer Einsatz und seine Hingabe. Von 1970 bis 1978 engagierte er sich als Dekan, Prodekan und Wahlsenator der Tierärztlichen Fakultät München, und er vertrat seine

Universität als Delegierter bei der Deutschen Tierärzteschaft. Jahrelang war er auch als Vorsitzender des Ausschusses für die Tierärztliche Vorprüfung, als Fachgutachter für Theoretische Veterinärmedizin bei der Deutschen Forschungsgemeinschaft, und als Fachtierarzt für Anatomie in Prüfungsausschüssen tätig.
Im Aufgabenbereich eines Anatomen dominiert schon immer der umfangreiche Lehrbetrieb. Das war auch der Fall bei Prof. Vollmerhaus, der in seiner Lehrtätigkeit auf unzählige Vorlesungen, Sektionen, Übungen und Demonstrationen zurückblicken kann. Nicht unerwähnt bleiben dürfen seine hervorragenden Beiträge in zahlreichen Lehrbüchern, insbesondere dem *Lehrbuch der Anatomie der Haustiere*, herausgegeben von R. Nickel, A. Schummer und E. Seiferle.
Neben diesem umfangreichen Lehramt, hat Professor Vollmerhaus noch eine beeindruckende Reihe wissenschaftlicher Arbeiten publiziert, und auch die Liste seiner fachinhaltlichen Vorträge und öffentlichen Reden überschreitet weit die Hundert. Aus seiner fürsorglichen Obhut sind über 40 Doktoranden hervorgegangen, die er alle in seine Forschungsschwerpunkte eingebunden hat, so z.B. bei Untersuchungen am Blut- und Lymphgefäßsystem, weiblichen Reproduktionsorgan, Verdauungsapparat, Bewegungsapparat unter funktionellen und klinisch-angewandten Aspekten sowie auf dem Gebiet der Anatomie der Vögel. Drei seiner Mitarbeiter hat er zur Habilitation geführt.
As Schriftleiter und Mitherausgeber des Zentralblatts für Veterinärmedizin, Reihe C, "Anatomia, Histologia, Embryologia" hat Professor Vollmerhaus von 1980 bis 1989 mit Akribie und großem Engagement gewirkt.
Aufgrund seiner umfangreichen Kenntnis und Verwaltungserfahrung wurde er - fast selbstverständlich - häufig von internationalen wissenschaftlichen Kommissionen in Anspruch genommen. So war er eine jahrelange Triebkraft des Internationalen Komitees für Veterinär-Anatomische Nomenklatur, und 1990 bis 1994 fungierte er als Präsident der Europäischen Vereinigung der Veterinär-Anatomen. Sein außerordentliches Engagement als erster Vorsitzender der Otto-Zietzschmann-Preises zur Förderung der veterinär-embryologischen Forschung soll hier hervorgehoben werden.
Nachdem er 1996 emeritiert wurde, blieb Professor emeritus Vollmerhaus weiterhin dem Studium der Wissenschaften aktiv ergeben. Das alles rundet sich ab in einem Gesamtwerk, das das Fachgebiet

Veterinäranatomie weit überschreitet, weil es auch diverse wissenschaftliche und kulturgeschichtliche Themen umfasst. Dazu gehört ein breites Areal von Artikel über die Geschichte der Veterinärmedizin, der Tieranatomie und des anatomischen Unterrichts in verschiedenen deutschen veterinär-anatomischen Instituten, ebenso wie manche Biographien von herausragenden Morphologen. Aber auch kulturhistorischen Themen wie Lernen und Gedächtnis, Entwicklung der Sprache, und den naturwissenschaftlichen Zeichnungen des Leonardo DA VINCI, galt sein spezielles Interesse.

Das hohe Ansehen, das Professor Vollmerhaus als kompetenter und vielseitiger Wissenschaftler genießt, ist durch seinen Kollegen Prof. Dr. Karl-Heinz Habermehl treffend in Worte gefasst : *"Alles was Bernd Vollmerhaus spricht oder schreibt, ist kritisch durchdacht und so präzis ausgedrückt, daß er als ein Ästhet der anatomischen Sprache gelten kann..."*

Eine bessere Einführung zur nachfolgenden Vorlesung des heutigen Laureates der Sarton-Medaille ist kaum möglich.



ÜBER DEN URSPRUNG DER VÖGEL UND DEN VOGELFLUG ALS GEGENSTAND ANATOMISCHER FORSCHUNG. EIN GESCHICHTLICHES MOSAIK

Bernd Vollmerhaus

Inhalt

George SARTON (1884 – 1956), der „Vater der Geschichte der Wissenschaft", hat eindringlich die Beschäftigung aller Wissenschaftler mit der Geschichte ihres Faches gefordert. Für die Veterinärmedizin hat August POSTOLKA, der 1887 in Wien eine „Geschichte der Thierheilkunde" geschrieben hat, formulierte: „Wer von der Geschichte seines Faches ... nichts weiß, ist ein Fremdling in seinem eigenen Haus". Tatsächlich kann man durch die historische Aufarbeitung den eigenen Lehr- und Forschungsgegenstand besser ganzheitlich begreifen, planvoll durchdringen und mit Begeisterung weiter entwickeln und vermitteln.

In diesem Sinne sei die geschichtliche Entwicklung der Morphologie der Vögel beschreiben, der sich nun nicht nur Anatomen gewidmet haben, sondern Naturwissenschaftler verschiedenster Richtungen, Zoologen, Botaniker, Mathematiker, Geologen, aber auch Philosophen und Theologen sowie viele Autodidakten, darunter Persönlichkeiten

kaiserlichen Geblüts. Kurzum: Menschen unterschiedlicher Herkunft und Zeiten haben durch die Anziehungskraft des Bezüglichen einen Wissenszweig gestaltet und geweitet.

So ist ein Aspekt dieser Vorlesung, eine **Personengeschichte** vogelkundlichen Wissens vorzustellen. Als weitere Betrachtungsweise soll eine **Sach- oder Problemgeschichte** dieses Wissenszweiges herausgearbeitet werden, weil das die Vernetzung fachspezifischer Ideen mit denen des zeitadäquaten allgemeinen Denkens aufzuzeigen vermag.

Ich beginne mit dem Ursprung der Vögel vor rund 150 Millionen Jahren. Vögel, Aves, sind warmblütige, geflügelte Abkömmlinge der Archosaurier mit dem unverwechselbaren Charakteristikum des Federkleids. Damit wird der Ursprung der Vögel mit dem ersten Auftreten der Feder gleichgesetzt; diese Lehrmeinung ist nicht mehr unumstritten.

Archaeopteryx - Forschung
Der Fund der ältesten Feder datiert aus dem Jahre 1860. Es handelt sich um den Abdruck einer fossilierten Einzelfeder aus dem Solnhofener Plattenkalk, der vor rund 150 Millionen Jahren entstand. Die Konturfeder ist etwa 6 cm lang, hat eine kurze Spule und ist sekundär mit Manganoxid eingefärbt.
Der Fund erregte in der Gelehrtenwelt Aufsehen, weil Vögel für dieses frühe Erdzeitalter ausgeschlossen wurden. Stimmen wurden laut, die eine Fälschung vermuteten. Deshalb wurde der Frankfurter Zoologe Hermann von MEYER (Abb. 1), eine Autorität unter den Palaeontologen, um eine Begutachtung gebeten. In einer Notiz an das „Neue Jahrbuch für Mineralogie, Geologie und Paläontologie" bestätigte er 1861 die Echtheit des Fossils. (Tabelle 1)
Als Namen für die Tierart, die diese Feder einst trug, schlug er *Archaeopteryx lithographica* vor, wobei der Gattungsname sich aus *Archaios* = alt und *pteryx* = Feder zusammensetzt, und der Artname *lithographica* darauf Bezug nimmt, daß das Fossil auf einer für die Lithographie vorgesehenen Platte gefunden worden war.

Archaeopteryx starb zusammen mit den Dinosauriern spätestens am Ende der Oberkreide aus. Erhalten ist uns der Urvogel in 9 fossilen Exemplaren, die sämtlich in und um Solnhofen gefunden wurden.
Eine glückliche Fügung brachte es mit sich, daß noch im gleichen Jahr 1861 das erste dieser Fossile auf der Langenaltheimer Haardt, einem Steinbruch nahe Solnhofen, als Überreste eines kleinen Wirbeltiers ohne Kopf gefunden wurde. An dieser Stelle sei angemerkt, daß es rund 130 Jahre nach dem Fund gelang, doch einen Schädelrest aus der Tiefe der Gesteinsplatte zu isolieren; und jüngst haben Angela MILNER und ihr Team daraus die Schädelhöhle dreidimensional rekonstruieren können. Das Besondere an diesem Fossil sind die gut erkennbaren Federabdrücke an den zwei flügelähnlichen Vordergliedmaßen und der von Federn umsäumte Schwanz.
Man muß bedenken, daß zwei Jahre zuvor, 1859, Charles DARWIN seine Abstammungstheorie veröffentlicht hatte. Dieser Fund des ersten Urvogels repräsentierte das Skelett einer Echse und das Federkleid eines Vogels, stellte also gleichsam das Bindeglied zwischen zwei Tierklassen dar. Das kam den Befürwortern der Darwinschen Lehre sehr entgegen. Aber auch seine Gegner waren damals recht lautstark. Zu ihnen zählte der Konservator der Königlich Bayerischen Staatssammlung Andreas WAGNER. Er empfahl, ein Kaufangebot abzulehnen. Er veröffentlichte jedoch über den Fund einen kleinen wissenschaftlichen Bericht, der Richard OWEN (1804 – 1892) bekannt wurde. OWEN war der Direktor des Britischen Naturkundemuseums in London. Er war an der Ausweitung seines Museums sehr interessiert. So wechselten nach langwierigen Verhandlungen Platte und Gegenplatten den Besitzer. Seitdem wird dieser Urvogel das Londoner Exemplar genannt. OWEN, ein Gegner Darwins, hat es ausführlich beschrieben; aber erst Thomas Henry HUXLEY, ein Londoner Zoologe, zugleich Befürworter Darwins, hat dann den Urvogel das „missing link" genannt.
15 Jahre nach dem Fund des ersten trat ein zweites Exemplar bei Eichstätt zutage: 1876. Ein besonders schönes und vollständiges Fossil, bei dem auch der Schädel sofort sichtbar war. Das Fossil wurde der Berliner geologisch-paläontologischen Sammlung angeboten; dort gab es ein hohes Interesse, aber es fehlte – wie im Kulturbereich üblich – das Geld. Der Berliner Industrielle Werner von SIEMENS (1816 – 1892) erbot sich, die Kaufsumme vorzuschießen. So wurde es das Berliner Exemplar. Lange Zeit wurde es als *Archaeopteryx siemensi* geführt.

Wilhelm DAMES, Kustos der Sammlung, hat das Exemplar untersucht und beschrieben. Als typisch reptilartig gelten der Schädel mit den Zähnen und der kleinen Schädelhöhle, die einfachen Rippen, die Bauchrippen (sogen. Gastralia als Versteifung der Bauchdecke), das Becken, die Schwanzwirbelsäule sowie das Hand- und Fußskelett. Vogelartig sind die Federn und das Gabelbein; letzteres wird neuerdings als Unterscheidungsmerkmal in Frage gestellt.

Wenn ich die Fundgeschichte der Archaeopteryx-Fossilien in schneller Folge komplettiere, beschränke ich mich auf die vollständigen Exemplare und übergehe die Funde, die nur Fragmente zeigen (im übrigen siehe die Tabelle 1 zur Fundgeschichte).

Als 5. Fund wurde das Eichstätter Exemplar 1951 entdeckt und an den Leiter der Naturkundlichen Sammlung im Bischöflichen Seminar Eichstätt, Franz Xaver MAYR (1887 – 1974), verkauft. Er hielt das Fossil zunächst für einen kleinen, zweibeinigen Dinosaurier. Erst 20 Jahre später bemerkte er bei seitlicher Beleuchtung die schwachen Federabdrücke. Peter WELLNHOFER (geb. 1936) hat es beschrieben. Das Exemplar wird als sehr junges Individuum eingeschätzt. Der Schädel ist besonders gut erhalten; sogar die kleinen Knochenplatten des Skleralrings treten in Erscheinung.

Als 6. Fund tauchte 1987 in der Sammlung des Altbürgermeisters Friedrich MÜLLER das Solnhofener-Exemplar auf. Wann und wo es gefunden wurde, war angeblich nicht mehr zu ermitteln. Es entbrannte ein jahrelanger Rechtsstreit. Nunmehr ist es im Besitz der Gemeinde Solnhofen. Auch dieses Exemplar hat Peter WELLNHOFER beschrieben. Die ursprünglich zerbrochene Platte war notdürftig aneinandergefügt. Eine Gegenplatte existiert nicht.

Der 7. Fund ist 1992 geborgen worden und auf Platte und Gegenplatte besonders gut erhalten. Auf der einen treten die Skelettteile, auf der anderen die Federabdrücke stärker in Erscheinung. Der Fundort, die Langenaltheimer Haardt, ist mit dem des Londoner und Maxberg-Exemplars identisch. Es lag jedoch in einer höheren, das heißt geologisch jüngeren Schicht. WELLNHOFER hat die Einzelknochen vermessen, mit allen vorherigen verglichen, und er kommt zu dem Schluß, daß eine neue

Art der Gattung Archaeopteryx vorliegt, der er den Namen *Archaeopteryx bavarica* gibt.

Im Ergebnis hat die Archaeopteryx – Forschung zwei Problemkreise erschlossen und beflügelt:
1) Einen g e n e a l o g i s c h e n: Ist Archaeopteryx wirklich der Vorfahre unserer heutigen Vögel und woher stammen die Urvögel selbst?
2) Einen f u n k t i o n e l l – e t h o l o g i s c h e n : Sind mit Archaeopteryx die Federn entstanden und hat mit dem Urvogel die neue Art des Fliegens, der von Federn getragene Vogelflug, begonnen?

Bis vor etwa 20 Jahren wußte man nicht viel über den Ursprung der Urvögel und auch nicht über ihre direkten Nachkommen. Archaeopteryx stand extrem isoliert in der Systematik der Sauropsiden. Deshalb wurde von PYCRAFT (1910) über NOPSCA (1923) bis STEINER (1917) und anderen ein hypothetischer Vorvogel, *Proavis*, erdacht, bei dem es zur Verlängerung der Schuppen an den Armen und Körperflanken bis hin zum Schwanz gekommen sein könnte. Auf dieser Hypothese gründet sich auch die Vorstellung, daß Federn aus Schuppen hervorgegangen sein müssten, ziemlich plötzlich und durch Aufspaltung. Auf der anderen Seite hatte von Nachfahren lediglich eine Gattung eine gewisse Bedeutung erlangt: *Hesperornis*, die von MARSH beschriebenen pinguinartigen Zahnvögel. Aber Gestalt und Verhalten dieser Vögel waren gegenüber Archaeopteryx so unterschiedlich, daß sie wohl keine direkte Ableitung sein konnten.
So beklagen Lehr- und Handbücher, wie ungewöhnlich selten Vogelfossilien seien, und daß diese Lückenhaftigkeit in der Dokumentation über eine Stammesgeschichte der Vögel Grenzen setze. Das hat sich in den letzten zwei Jahrzehnten aufgrund zahlreicher Fossilfunde aus England, Frankreich, Rumänien, der Mongolei, vor allem aber aus Spanien und China total geändert.
Die Vielzahl der Funde befiederter Saurier und früher Vögel mit den unterschiedlichsten Kombinationen von Saurier- und Vogelmerkmalen erlauben jedoch immer noch nicht in eine widerspruchsfreie Stammbaumableitung vom Archosaurier zum modernen Vogel. Vielmehr müssen wohl Parallelentwicklungen angenommen werden und

Archaeopteryx ist nur ein Ableitungsmodell, wie Vögel aus Sauriern hervorgegangen sein könnten.

Befiederte Saurier und frühe Vögel
Kein Zweifel besteht unter den Paläontologen, daß die Vögel von Archosauriern abstammen. Einige Autoren möchten unter den Einfluß von Gerhard HEILMANNs Buch „The Origin of Birds" (1926) den Ursprung in die frühe Zeit der *Tecodontier*, den Wurzelzähner, stellen. Immer mehr Fachleute schließen sich nun der Vorstellung von John OSTROM (geb. 1928) an, der die Vögel aus zweibeinig rennenden *Coelurosauriern* (sogen. Hohlknochensaurier) hervorgehen läßt. OSTROM hat in Begleitung von WELLNHOFER die neueren Funde von Dinosauriern in China begutachtet, die seine Theorie belegen. Hier drei Beispiele aus seinem Bericht, die zugleich auch die Evolution der Federn neu beleuchten: *Sinosauropteryx prima*, 1996 von zwei chinesischen Forschern, JI QIANG und JI SHU-AN beschrieben, stammt aus der Provinz Liaoning im Nordosten Chinas. Das Fossil stellt einen kleinen Raubdinosaurier dar, an dessen Oberseite vom Kopf über Rücken bis zum Schwanz und auf der Unterseite des Schwanzes ein bis 2cm hoher Besatz an feinen Borsten oder Filamenten angeordnet ist. Diese Strukturen könnten borstenartige Federn sein, und so wurde von „befiederten" Dinosauriern gesprochen: Auch der Name deutet das an: *Sin* = eine aus China stammende, *sauros* = Echse, *pteryx* = mit Federn ausgestattet.
Ein weiterer Fund aus Liaoning trat 1999 auf. XU-XING/WANG XIAO-LIN/WU XIAO-CHUNG nannten ihn *Sinornithosaurus millenii*. Dieser frühe Saurier ist vom Skelett her Archaeopteryx sehr ähnlich. Das Fossil war von Integumentfasern regelrecht eingehüllt. Bei feinerer Betrachtung zeigten sich zwei Strukturen: Einerseits büschelförmige Filamente, andererseits Einzelfilamente, von denen serial Seitenäste abzweigten.

In dieser Reihe ist noch ein dritter Fund interessant: *Caudipteryx zoui*, 1998 entdeckt von dem bereits genannten Ji Qiang/P.J. CURRIE/M.A. NORELL/JI SHU-AN. Der Gattungsname „Schwanzflügel" nimmt Bezug auf die Tatsache, daß an beiden Seiten des Schwanzendes je 11 symmetrische Federn standen. Auch an der Hand fanden sich relativ kurze, symmetrische Federn.

Diese exemplarisch ausgewählten Beispiele geben Veranlassung, die bisherige Anschauung über den Ursprung der Feder neu zu überdenken. Waren, so das bisherige Postulat, die Federn aus den Schuppen der Saurier hervorgegangen, oder waren sie Neubildungen? Und schon sind erste Hypothesen publiziert, so von WELLNHOFER (2002) bzw. PRUM und BRUSH (2003), wonach in Anlehnung an die Ontogenese auch in der Phylogenese die Feder in mehreren Stufen evolviert.
Bleibt also die Feder ein Charakteristikum der Vögel oder waren nicht schon vorher einige Raubsaurier befiedert? Die Frage lässt sich durch cladistische Definition klären.
Die weitere Frage aber, sind „fertige Federn" zugleich Ausdruck der Flugfähigkeit ihrer Träger, muß ausführlicher beantwortet werden.

Aktives Fliegen bei Wirbeltieren fordert eine Verbreiterung der Vordergliedmaßen, damit Ruderflug möglich wird. Zur Verbreiterung können Flughäute oder Federn herangezogen werden. Daß eine Flughaut dazu befähigt, haben die Flugsaurier gezeigt; sie waren die ersten fliegenden Wirbeltiere. Sehr viel später (vor 55 Millionen Jahren) haben nach diesem Prinzip auch Säugetiere zum Fliegen gefunden. Die Verbreiterung der Vordergliedmaßen durch Federn, also die Bildung eines Flügels, war bei Archaeopteryx vollzogen. Deshalb waren alle Archaeopertyx-Forscher davon überzeugt, ihr Untersuchungsobjekt konnte zumindest Gleitfliegen und Flattern. Aber jüngst hat PETERS (1995) deutlich gemacht, daß es konstruktive Gesetze gibt, die zur Eingruppierung in eine höhere Entwicklungsstufe erfüllt sein müssen. Die vollständige Vogelfeder allein reicht dazu nicht aus. Fossile Belege dafür lieferten u.a. die Funde von Unterkreide-Vögeln in Spanien. Genannt sei *Iberomesornis*, der in zwei Arten 1984 und 1992 in Las Hoyas gefunden wurde und dessen Alter auf etwa 125 Millionen Jahre – also 25 Millionen Jahre jünger als Archaeopteryx – geschätzt wird. Der sperlinggroße Vogel besaß bereits ein verknöchertes Brustbein mit Carina, ein Gabelbein mit Hypocleidium, eine Reduktion des Handskeletts und eine verkürzte Schwanzwirbelsäule mit Pygostyl, d.h. große Ansatzflächen für die Flugmuskeln, eine verkürzte stabile Grundlage für Schwingen und Steuerfeder und die Verlagerung des Schwerpunkts in den Schulterbereich. Das waren wichtige, an diesen Fossilien erkennbare Voraussetzungen, um den Beginn des Vogelflugs für dieses Erdzeitalter als gesichert anzusehen. Auch andere

Unterkreidevögel zeigen am Skelett Veränderungen, die eine schrittweise Verbesserung von Flugleistung und Manövrierfähigkeit vermuten lassen. So hatten sich die Vögel zumindest von diesem Zeitpunkt an den Vorteil verschafft, der ihnen ihre große Verbreitung sicherte.

Alan FEDUCCIA (1995), hat die Evolution der Vögel zusammengefaßt. Unter Berücksichtigung der neuen Funde ergibt sich folgendes Bild (Abb. 2): Im Oberjura, vor 150 Millionen Jahren, lebte *Archaeopteryx*; er stammte von den Dinosaurien ab. In der Unter- und Oberkreide breiteten sich befiederte Saurier und Vögel aus, die zu großen Teilen vor 65 Millionen Jahren ausstarben. Erst im Altterziär erfolgte aus einem schmalen Reststamm die erste Radiation, aus der die meisten Ordnungen einschließlich der Ratiten hervorgingen. Weitere rund 30 Millionen Jahre vergingen, bis im Jungtertiär in einer zweiten Radiation die Passeriformes, Sperlingsvögel, auftraten. Damit hatte die Vogelwelt im wesentlichen ihre heutige Vielfalt erlangt.
Soviel zur Geschichte der Forschung über den Ursprung der Vögel.

Die Erforschungsgeschichte der Vögel
Nun trat der Mensch auf den Plan. Zunächst war er Sammler und Jäger, der um seine Selbst- und Arterhaltung besorgt war. Ende der Altsteinzeit regte sich seine schöpferische Kraft und er wurde zum Erfinder und Künstler. Aus dieser vorgeschichtlichen Zeit haben Archäologen vor zwei Jahren die weltweit bislang älteste Darstellung eines Vogels geborgen. Weitere kleine Figuren, ein Pferdekopf und ein Löwenmensch, waren alle aus Mammut–Elfenbein geschnitzt. Fundort war eine Höhle bei Blaubeuren, Hohler Fels genannt. Unter dem Fundgut befand sich auch eine kleine Flöte, 11,7 cm lang, die aus einem Unterarmknochen des Singschwans, *Cygnus cygnus*, hergestellt war.
Können wir uns vorstellen, was der unbekannte Steinzeitmensch vor ca. 35.000 Jahren auf dieser Flöte gespielt haben mag?

Hat er den Gesang eines Vogels immitiert?

Oder sich vielleicht eine eigene Melodie ausgedacht?

Wir wissen natürlich nicht, ob es so war; sicher ganz anders!
Aber die Möglichkeiten, sich mit diesem frühesten Instrument auszudrücken, seien an den Beginn des geschichtlichen Mosaiks zur Erforschungsgeschichte der Vögel durch den Menschen zu stellen, weil alles, was Wissen, Kunst und Kultur des Menschen ausmacht, damals aus

dem Nichts in einfachster Form entstanden ist. Hier von primitiver Form zu sprechen, wäre mir zu abwertend; denn es war ja ein gewaltiger Sprung vom Nichts zum ersten, ursprünglichen Ereignis. Poetisch ausgedrückt, war es die „Morgendämmerung der Menschheit", als im frühen Menschen die schöpferische Kraft erwachte!!
Wie fein war die kleine Vogel-Figur gestaltet: Der schmale Kopf mit Schnabel und Augen, der lange, schlanke Hals; der Rumpf trägt Andeutungen eines Federkleids.
Als Kuriosität sei erwähnt, daß – wie beim ersten Archaeopteryx-Fossil – auch hier zuerst der Rumpf entdeckt wurde und erst bei einer späteren Suchaktion der abgebrochene Kopf zum Vorschein kam. Aber die Bruchenden passten so eindeutig aufeinander, daß kein Zweifel an ihrer Zusammengehörigkeit blieb. Der Archaeologe Nicholas CONARD beschreibt 2003 die Figur aufgrund des Schnabels als Wasservogel mit angelegten Flügeln. Sie mag, wie die anderen Fundgegenstände, kultischen Zwecken gedient haben. Im Vergleich zu anderen vorgeschichtlichen Hinterlassenschaften ist der Fund mit rund 32.000 Jahren vor heute extrem früh einzuordnen. So kennen wir weitere vorgeschichtliche Kunstwerke, genannt seien Chauvet, Willendorf, Altamira und Lascaux; die Zeichnungen des letztgenannten Fundorts entstanden etwa 20.000 Jahre später.
Aus der Höhle Lascaux zeigt eine Szene des Schachtes neben dem verwundeten Bison und dem sich abwendenden Rhinozeros den liegenden Menschen (vielleicht ein Schamane) und einen auf einer Stange sitzenden Vogel (Abb. 3). Eine Interpretation von H. KIRCHNER (1952) unterlegt der Szene, daß der Vogel ein Hilfsgeist sei, ohne den der in Trance liegende Schamane seinen Himmelsflug nicht unternehmen könne. Auch andere Deutungen werden diskutiert. Ohne auf Einzelheiten eingehen zu können, ist anzunehmen, daß der Vogel für den Frühmenschen kultische Bedeutung hatte.

Wir verlassen die vorgeschichtliche Zeit und wenden uns nun gesicherten Daten zu: Wir betrachten das klassische Altertum, in dem die Vogelkunde in den Rang einer Wissenschaft erhoben wurde. Wenn wir dem bekannten Ornithologen Erwin STRESEMANN (1951) folgen, dann hat die Ornithologie mit ARISTOTELES (384 - 322 v. Chr.) begonnen. Seine überlieferten Werke umspannen nahezu den ganzen Umkreis des antiken Wissens. Für unsere Fragestellung ist seine „Geschichte der

Tiere“ bedeutsam, die sich in einigen Kapiteln den Vögeln widmet. ARISTOTELES nennt 140 Vogelarten, die er deskriptiv gliedert in solche, die auf dem Land leben, sich an Seen und Flüssen aufhalten oder das Meer und die Küsten bevölkern. Erwähnenswert auch die Beschreibung der Entwicklung des Hühnchens im Ei. Seine Sicht des Morphologisch-Physiologischen führt zu der Mahnung, daß es einem philosophischen Geist angemessen sei, sich mit der Natur auseinanderzusetzen.
Fast 1.500 Jahre später hat Graf Albert von Bollstädt, genannt ALBERTUS MAGNUS (1193 – 1280), scholastischer Gelehrter und Dominikaner, die Werke des Aristoteles übersetzt und kommentiert (Abb. 4). Dabei hat er sich als selbständiger Beobachter ausgewiesen. Durch ihn sind die naturwissenschaftlichen Lehren der Antike dem christlichen Abendland verständlich gemacht geworden.

Zur gleichen Zeit hat der Stauferkaiser FRIEDRICH II (1194 – 1250) die Naturkunde auf hohem Niveau neu belebt. In seinem Opus über die Falkenjagd „De arte venandi cum avibus“ (Abb. 5) sind eigene Beobachtungen festgehalten. Das Original dieses Werkes ging verloren. Eine Zweitschrift, die sogenannte Manfred-Handschrift, wurde von seinem Lieblingssohn Manfred, König von Sizilien, dem Original nachempfunden. Sie enthält mehr als der Titel „Die Kunst, mit Vögeln zu jagen“ aussagt. Beizvögel und Beutevögel werden beschrieben und bildlich in Miniaturen dargestellt, sowie nach Umwelt und Nahrungserwerb eingeteilt. Das Verhalten der Vögel im Rhythmus des Tages, Vogelflug und Vogelzug sowie anatomische Details sind Gegenstand der Schrift. Das leidenschaftliche Interesse des Stauferkaisers an der Tierwelt weist ihn, wie STRESEMANN formuliert, „zum ersten großen Ornithologen aus, den die Geschichte kennt“.

Im Mittelalter hatte die Jagd auf und mit Vögeln ihre Blütezeit. Während die Beizjagd mit abgerichteten Greifvögeln dem Hochadel und den Kirchenfürsten vorbehalten war, mußten niederer Adel, Bürgertum und Bauern mit dem Vogelfang vorlieb nehmen. Mittelalterliche Buchtitel belegen das (Abb. 6).

In unserer historische Zeitraffung erreichen wir die Renaissance und treffen auf das Universalgenie LEONARDO DA VINCI (1452 – 1519),

Maler und Bildhauer, Baumeister und Erfinder, aber auch Anatom und Naturforscher. Seine anatomischen und physiologischen Studien eilen der Zeit weit voraus. Zeichnungen zur Anatomie des Vogelflügels und zur Technik des Fluges finden sich verstreut in diversen Handschriften. Überlegungen, warum sich der Vogel in der Luft hält und im Gegenwind schweben kann, ohne die Flügel zu schlagen, sind für die damalige Zeit neuartig. In der kurzen Zeitspanne eines Monats entstand 1505 der „Codex über den Vogelflug", eine geschlossene Abhandlung auf 18 Blättern mit Argumenten und erklärenden Zeichnungen (Abb. 7). Im Übrigen nimmt Leonardo die ganze Breite der Flugforschung vorweg, angefangen bei der Konstruktion des gerippten Flügels, über den Fallschirm bis hin zur Idee des Helikopters. Ob er jemals Flugversuche unternommen hat, wie er mit den Worten ankündigte: „Von dem Berg, der seinen Namen trägt, wird der berühmte Vogel seinen Flug antreten", wir wissen es nicht. Gemeint war der Schwanenberg oberhalb von Florenz, den er als Übungsplatz ausgewählt hatte. Dort steht eine entsprechende Gedenktafel, die seine Hoffnung festhält.

Inzwischen hatten sich die Universitäten etabliert und so nimmt es nicht wunder, daß die folgenden Meilensteine dort gesetzt wurden. Hieronymus FABRICIUS (1533 – 1619), nach seinem Geburtsort ab Aquapendente genannter Anatom und Chirurg, wirkte 54 Jahre auf dem Lehrstuhl seiner Universität Padua. Er arbeitete auf dem Gebiet der vergleichenden Anatomie und Entwicklungsgeschichte und hat eine Reihe wichtiger Arbeiten über die Anatomie und Physiologie der Vögel hervorgebracht. Organe des Verdauungs- und Atmungsapparats fallen darunter; hervorzuheben die Kloake mit dem nach ihm benannten Organ: Bursa cloacalis Fabricii; Und dann eben auch Flügel und Bein in Verbindung mit Ausführungen zu Flug und Gang. Bei Hieronymus Fabricius zeigt sich zudem, wie wichtig es ist, gute Lehrer zu haben, denn unter seinen Schülern befinden sich bedeutende Namen wie William HARVEY und Caspar BARTHOLIN.

Auch Giovanni Alfonso BORELLI (1608 – 1679) war ein erfolgreicher Universitätslehrer. Er gilt als Begründer der Bewegungsphysiologie. In seinem posthum erscheinenden Werk: „De motu animalium" (1680) werden die Schwimmbewegung der Fische und der Flug der Vögel quantitativ erfaßt (Abb. 8). Er führte das physikalische Experiment in die

Biologie ein. Bau und Wirkungsweise der Flügelschlagmuskeln wurden mit Methoden der Mathematik und Mechanik bewertet, der Flügelschlag in hebende und vortreibende Kraftkomponenten zerlegt und die Steuerung durch den Flügel untersucht. Seine Berechnung führte zu dem Schluß, daß das Verhältnis von Muskelkraft und Körpergewicht der Vögel im Vergleich zu dem der Menschen dafür spräche, daß letzterer n i c h t aus eigener Kraft würde fliegen können.
Experimentelle Arbeiten steuerten der englische Gelehrte Sir George CAYLEY (1773 – 1857) und der französische Physiologe Jules MAREY (1830 – 1904) bei. Cayley führte die windströmungsgünstige Form des spindelförmigen Körpers von Forelle und Waldschnepfe ins Experiment ein. Marey hatte Instrumente zur Registrierung von Körperbewegungen entwickelt. Ihm gelangen sowohl Reihenbildaufnahmen vom Vogelflug als auch die graphische Erfassung von schnellen Bewegungsabläufen.

Auf der Grundlage der bisher genannten Prinzipien beobachtete Otto LILIENTHAL (1848 – 1896) – zusammen mit seinem Bruder Gustav – den Flug von Störchen, Möven und anderen Vögeln, und er erkannte dabei den Vorteil des gewölbten Vogelflügels. Er experimentierte mit Flügelprofilen. Die Meßergebnisse lieferten Anhaltspunkte für den Bau seiner Gleitflugapparate. 1889 erschien seine Monographie „Der Vogelflug als Grundlage der Fliegekunst" (Abb. 9). 1891 gelang der erste Gleitflug. Otto LILIENTHAL war der erste Mensch, der das Fliegen lernte. Wenige Jahre später, 1903 gelang u.a. den Brüdern WRIGHT der erste Motorflug. Das ist erst 100 Jahre her; jeder kennt die gewaltige Entwicklung, die durch diese Pionierleistungen ausgelöst wurde.

Kehren wir zurück zur anatomischen Konstruktion von Feder und Flügel in Form und Funktion. Auch sie hat eine stürmische Entwicklung genommen.

Hier sei ein Exkurs eingeschoben, der nichts mit der Anatomie der Vögel, wohl aber etwas damit zu tun hat, in welcher Weise ganz allgemein anatomische Kenntnisse gewonnen werden. Dabei komme ich auf den genialen flämischen Arzt und Anatomen Andreas VESALIUS (1514 – 1564) zu sprechen, der u.a. 1541 die Werke GALENs neu herausgab und dabei zu verschiedenen, von Galen abweichenden Beobachtungen kam. So entstand seine Neuerforschung der menschlichen Anatomie „De

humani corporis fabrica", mit der eine **moderne, wissenschaftlich fundierte Anatomie** ihren Anfang nahm. Die nachfolgenden Generationen von Anatomen fühlten sich einer auf exakter Beobachtung beruhenden Deskription verpflichtet.
Noch ein zweiter, sehr viel jüngerer Anatom, sei in diesem Zusammenhang erwähnt: Alfred BENNINGHOFF (1890 – 1953), der die Erforschung der funktionellen Systeme eingeführt hat. Seither sind im Grund genommen immer bewußter funktionelle Überlegungen in anatomische Arbeiten einbezogen worden, so auch in jene über den Vogelflügel und die Vogelfeder.

Die **Struktur der Vogelfeder** (siehe Tabelle 2), deren typische Geschlossenheit der Fahne auf einem Verhakungsmechanismus ihrer Äste zweiter Ordnung beruht, ist von Robert HOOKE 1664 beschrieben worden. Hooke war Professor für Geometrie in London und verbesserte technische Verfahren und Geräte, unter anderem auch das zusammengesetzte Mikroskop. In diesem Zusammenhang diente ihm die Vogelfeder als geeignetes Untersuchungsobjekt; das Geheimnis des Verhakungs- oder Klettmechanismus der Feder ist demnach gleichsam als Mittel zum Zweck gelüftet worden.

Die jüngere Forschung kann nur gestreift werden:
SICK sowie STEINER und viele andere haben sehr gezielt die Feinstruktur der Feder mit immer wieder erweitertem Instrumentarium aufgeklärt. Die Zeittafel mag dies zusammenfassen. Ebenso wie die speziellen Untersuchungen von GREITE, VÖLKER, SCHMIDT, AUBER und anderen über die Federfärbungen oder diejenigen von NITZSCH bis LUKAS/STETTENHEIM über Federarten und Befiederung.
Ein in sich geschlossenes Forschungsgebiet stellt die Federentwicklung dar, wobei experimentelle Untersuchungen die Regel waren: KUHN, HEIMROTH, Erwin und Vesta STRESEMANN, BRUN und andere haben so den Zusammenhang von Befiederung und innerer Sekretion sowie das Phänomen der Mauser und die Funktion der Federfollikel aufgeklärt. Dies im Einzelnen darzustellen, ist das Anliegen von Unterricht und Lehrbüchern.

In gleicher Weise können auch von der Erforschung der **Konstruktion des Vogelflügels** (siehe Tabelle 3) nur einige Grundlagenarbeiten genannt werden, um die Breite der Thematik aufzuzeigen. Sehr früh, nämlich 1575, steht die von großem Fleiß getragene Übersichtsarbeit des Volcher COITER über den gesamten Bewegungsapparat der Vögel: „De avium sceleti et praecipuis musculi", worin auch auf das reduzierte Handskelett und die Flugmuskeln im engeren Sinn eingegangen wird. Spezieller wird dann die Untersuchung von WRAY (1887) über die Morphologie des Vogelflügels, die aber der Deskription verhaftet bleibt. Danach folgen die funktionsbetonten Arbeiten etwa von SCHNEIDER über Aufbau und Funktion der Patagien, von OAKES/BIALKOWER über Bandapparat und Biomechanik der Schwingen, von OEHME/KITZLER über die Muskelleistung beim Kraftflug und von FISHER über verschiedene Automatismen in der Flügelbewegung. Gerade im letztgenannten Phänomen automatisierter Bewegungen liegt ein Geheimnis der Flügelbewegung. Das Anlegen der Flügel an den Körper, das Ausbreiten und Schlagen der Flügel während des Fluges ist deshalb von Reinhard DEMOLL, Konrad LORENZ und anderen einer besonderen Betrachtung unterzogen worden. Der spätere Nobelpreisträger Konrad LORENZ hatte mit seiner zoologischen Doktorarbeit (1933) eine Abhandlung geschrieben, deren Titel zwar – wie er selbst bekannte – etwas langatmig ist, aber tatsächlich besagt, was in ihr steht: „Beobachtetes über das Fliegen der Vögel und über die Beziehungen der Flügel- und Steuerform zur Art des Fluges". Einen Neudruck 1965 betitelt er kürzer: „Der Vogelflug", aber da waren er und seine Botschaft allgemein bekannt. Trotz grundsätzlich gleicher Konstruktionsprinzipien hat fast jede Vogelart eine eigene Flugtechnik entwickelt.
Gegenwärtig geht die Bestrebung dahin, aus der Biologie Funktionsmechanismen für technische Verfahren abzuleiten; man nennt diese Forschungsrichtung Bionik. In bezug auf die Flugtechnik haben in dieser bionischen Wissenschaft die „künstlichen Vögel" eines Erich von HOLST wegweisende Bedeutung erlangt.

Damit ist das Mosaik zusammengesetzt, es hatte zwar eine grobe Struktur, aber an Grundsätzlichem war doch zu merken, wie sehr hervorragende Persönlichkeiten in Abhängigkeit zu ihrer Zeit stehen.

Vogelkundliches Wissen ist allmählich entstanden, und auch unser heutiger Wissensstand ist nur eine Momentaufnahme. Um es frei mit George SARTON zu sagen:
„wir sind nicht in der Lage, unsere eigene Wissenschaft von heute zu verstehen (ich will nicht sagen, sie anzuwenden, sondern sie zu erinnerlichen), wenn es uns nicht gelingt, ihren Ursprung und ihre Entwicklung einzubeziehen. Wissen ist nämlich nichts Totes, Starres, sondern Fließendes, Lebendiges, stets in Bewegung befindliches. Die aktuellsten Resultate sind wie die neuen Früchte eines Baumes, sie dienen unserer sofortigen Nutzanwendung; aber insgesamt gesehen ist es der Baum, auf den es ankommt. Der Wissenschaftler mit philosophischem Gespür ist nicht so sehr an den jüngsten Resultaten der Wissenschaft interessiert, sondern an den bleibenden Strömungen eines lebendigen, stets wiedererblühenden, unsterblichen Baumes. Die heutigen Früchte mögen reizvoll genug sein, aber sie sind nicht in gleicher Weise für eine produktive Einsicht kostbar wie jene, die das, was Gestern war und Morgen sein wird, einschließt".

Zusammenfassung
Der Urvogel *Archaeopteryx lithographica* galt lange Zeit als Stammform der Vögel. Heute wird ihm die Bedeutung eines Ableitungsmodells zuerkannt, das zeigt, wie Vögel aus den Archosauriern hervorgegangen sein könnten. Viele neuere Fossilfunde vornehmlich aus den letzten zwei Jahrzehnten haben neue Zwischenformen zwischen den Tierklassen dokumentiert. Zugleich ist die Fragestellung aktualisiert worden, ob Federn aus Schuppen hervorgegangen sein könnten oder Neubildungen sind, die bereits bei einigen Sauriern angelegt wurden.
Vogelkundliches Wissen ist allmählich entstanden. In vorgeschichtlicher Zeit hat der Mensch die Vögel nicht nur gejagt, sondern sie hatten für ihn auch kultische Bedeutung. In Altertum und Mittelalter erlangte die Vogelkunde zunehmend den Rang einer Wissenschaft, die alle Vögel nach Bau und Verhalten kennen lernen und katalogisieren will. In der Neuzeit galt Forschung an und mit Vögeln vornehmlich der Grundlagenmehrung, aber auch Flugbiologie, experimentellen Forschung, Bionik und Vogelmedizin haben Nutzen daraus gezogen.

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Fossil	Fundjahr	Fundstätte	Erstbeschreibung	Aufbewahrungsort
Einzelfeder	1860	Solnhofen	v. MEYER (1861)	Berlin/München
Londoner-Exemplar	1861	Langenaltheim	OWEN (1863)	London
Berliner – "	1876	Eichstätt	DAMES (1884)	Berlin
Maxberg – "	1956	Langenaltheim	HELLER (1959)	(verschollen)
Haarlem – "	1855	Riedenburg	OSTROM (1970)	Haarlem
Eichstätter – "	1951	Workerszell	MAYR (1973) sowie WELLNHOFER (1974)	Eichstätt
Solnhofener – "	1987(?)	unbekannt	WELLNHOFER (1988)	Solnhofen
Münchener – "	1992	Langenaltheim	WELLNHOFER (1993)	München
8. Exemplar	1990	Altmühlalb	MÄUSER (1997)	unbekannt
9. Exemplar	2004	Solnhofen	WELLNHOFER (2005?)	Solnhofen

Tabelle 1. Zur Fundgeschichte der Urvogelfossilien (Stand Juli 2004)

Autoren: Forschungsgegenstand
Feinstruktur der Feder
R. HOOKE (1664): Verhakungsmechanismus
H. SICK (1937): Funktionelle Struktur
H. STEINER (1957): Elektronenmikroskop
M. LÜDICKE (1969: Rasterelektronenmikroskop
Federfluren/Federarten
L. NITZSCH (1840): Pterylographie
I. BROMAN (1941): Embryonaldunen
K. v. PFEFFER (1952): Fadenfedern
A. M. LUCAS/STETTENHEIM (1972): Gesamtschau, Federarten, Befiederung
Federfärbung
W. GREITE (1931, 1934): Melanine
O. VÖLKER (1939, 1944): Lipochrome
W. J. SCHMIDT (1948, 1952):Schillerfarben
L. AUBER (1957): Blaufärbung
Federentwicklung
O. KUHN (1927): Hormonwirkung
O. HEINROTH (1931): Federwechsel
R. LILLIE (1941, 1942): Federentwicklung
E. u. V. STRESEMANN (1966): Mauser
R. BRUN (1968): Federkeim

Tabelle 2. Zeittafel zur Erforschung der Struktur der Vogelfeder (eine Auswahl

Autoren: Forschungsgegenstand
Skelett,Gelenke, Muskeln (deskriptiv)
V. COITER (1575): De avium sceleti....
H .C. L. BARKOW (1856): Syndesmologie
R. S., WRAY (1887): Morphol. des Flügels
Bauelemente des Flügels (funktionell)
H. STEINER (1922): Entwicklung Flügelskelett
M. PELISSIER (1923): Bandapparat der Schwingen
H. SCHNEIDER (11942): Patagien
H. J. FISHER (1957): Automatismen
H. OEHME/N. KITZLER (1975): Muskelleistung
Flugbiologie (historischer Teil)
LEONARDO DA VINCI (1505*): Codex Vogelflug*
G. A. BORELLI (1680): De motu animalium
Flugbiologie (aktueller Teil)
R. DEMOLL (1930): Flugbewegungen
K. LORENZ (1933): Flügelform und Fliegen
E. von HOLST (1943): „künstliche Vögel"
K. HERZOG (1968): Anatomie und Flugbiologie
V. A. TUCKER (1969): Energetik des Vogelflugs
J. J. BAUMEL (1971): Vogelschwanz als 3. Flügel

Tabelle 3. Zeittafel zur Erforschung der Konstruktion des Vogelflügels (eine Auswahl)

Abb. 1: Hermann VON MEYER (1801 – 1869) benannte 1861 den Urvogel *Archaeopteryx lithographica.*

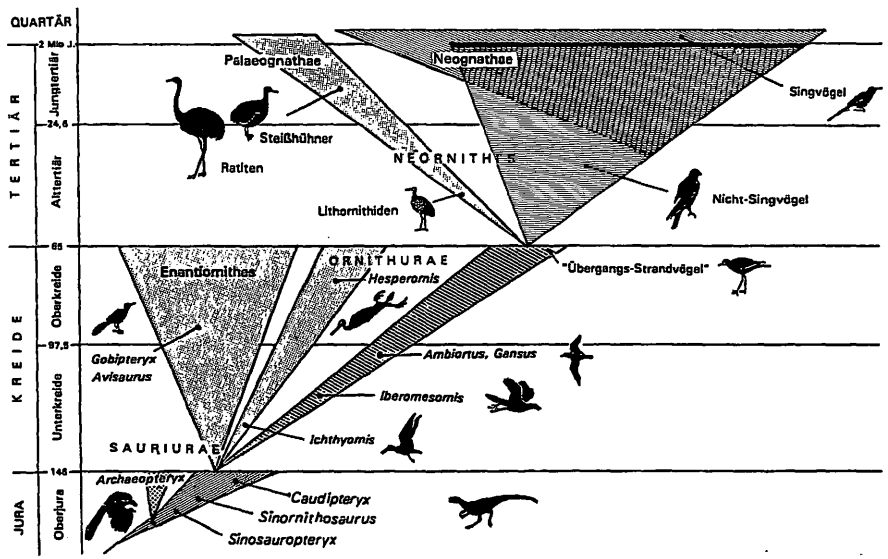


Abb. 2: Stammbaum der Vögel, nach A. FEDUCCIA, ergänzt

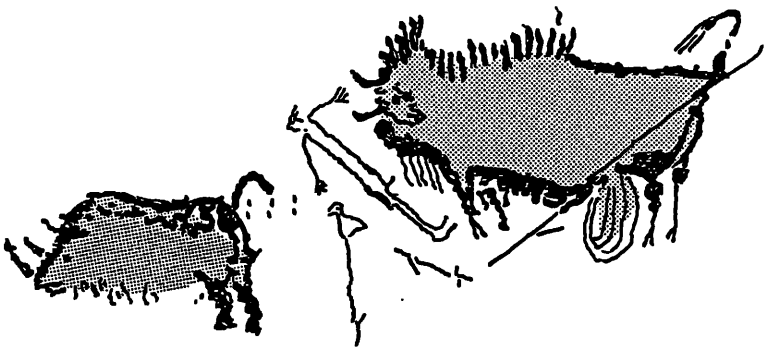


Abb. 3: Kopie der „Szene des Schachtes", Felsmalerei in der Höhle von Lascaux.
Rhinozeros (links), Bison (rechts), liegender Mensch und Vogel auf einer Stange (Mitte).

Abb. 4: Albertus MAGNUS (1193 – 1280) bei einer Kommentierung der Schriften des Aristoteles.

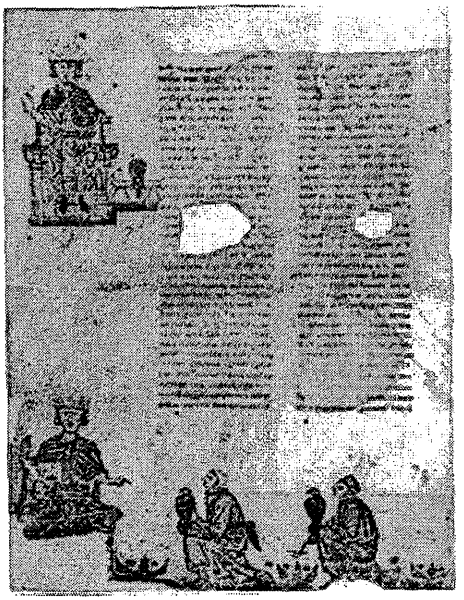


Abb. 5: FRIEDRICH II, Stauferkaiser (1194 – 1250). Aus dem Falkenbuch, „De arte venandi cum avibus", Manfred-Handschrift.

Abb. 6: Zwei mittelalterliche Bücher über die Beizjagd und das Vogelstellen: Links H. STAYNER (1531), rechts J.C. AITINGER (1653).

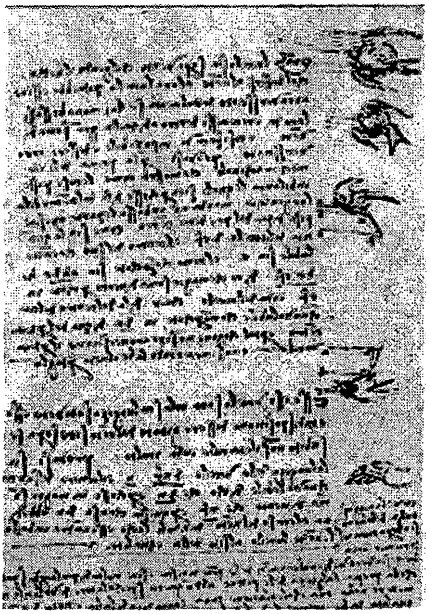


Abb. 7: LEONARDO DA VINCI (1452 – 1519): Seite aus dem „Codex über den Vogelflug", entstanden 1505.

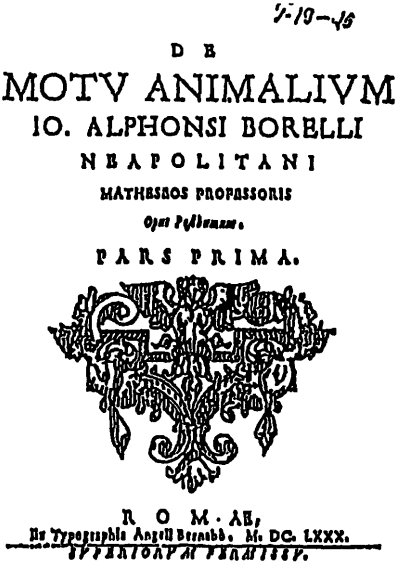


Abb. 8: Giovanni Alfonso BORELLI (1608 – 1679): Titelblatt zu „De motu animalium" (1680).

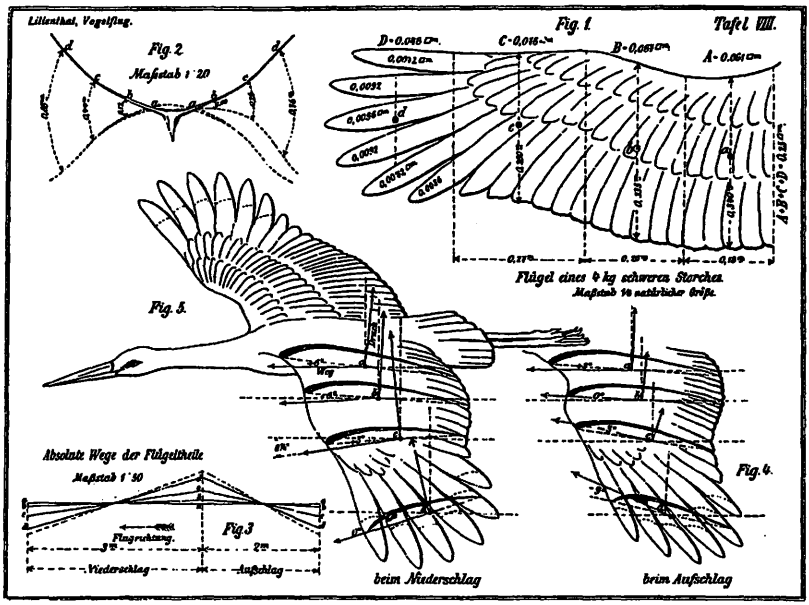


Abb. 9: Otto LILIENTHAL (1848 – 1896): Abbildung aus "Der Vogelflug als Grundlage der Fliegekunst" (1889).

LAUDATIO DITLEV TAMM

Dirk Heirbaut

Like many other legal historians Ditlev Tamm (Copenhagen, 1946) is both a lawyer and a historian, but unlike most of his colleagues he even went so far as to write two doctoral theses, one in law and one in history. Apart from that, he has written more than twenty books and numerous articles, both in his native Danish and in other languages, mainly in English and German, but also in Spanish, Italian or French and even in Finnish or Dutch. Likewise, he has given lectures in Danish, English, French, German, Italian and Spanish at several European and Latin American Universities, thus proving that a really great scholar is not constrained by language. His linguistic versatility only mirrors his broad interest for the most diverse subjects. He teaches legal history, comparative law and church law and has published about these subjects, but also about Danish political history, the history of universities and general cultural studies.

His first great research was made for the doctoral thesis in law and concerned the history of private law in nineteenth century Denmark. Already in this work a typical element of Ditlev Tamm's work surfaces: Danish legal history is not seen as an isolated phenomenon, but in a European context, which in this case means the influences of the German criminalist school, the German historical school and the French 1804 Civil Code. His fame as the specialist of nineteenth century private law in the Nordic countries was firmly established when Helmut Coing, director of the Max Planck Institute for Legal history in Frankfurt, the leading institution for legal history in the world, invited him to write the introduction to the volume in his handbook about the Nordic countries, thus making clear that he was the authority about the history of modern private law in the North. However, he has also written about older law, like the Danske Lov, the first real codification in Europe.

It would be wrong to conclude from all this that Ditlev Tamm is only a specialist of the history of private law, as he is also a specialist of Danish absolutism and Danish constitutional history. Moreover, nothing could be farther away from these traditional themes of legal history than the subject of his second thesis: collaboration in Denmark during World War II and its repression thereafter.

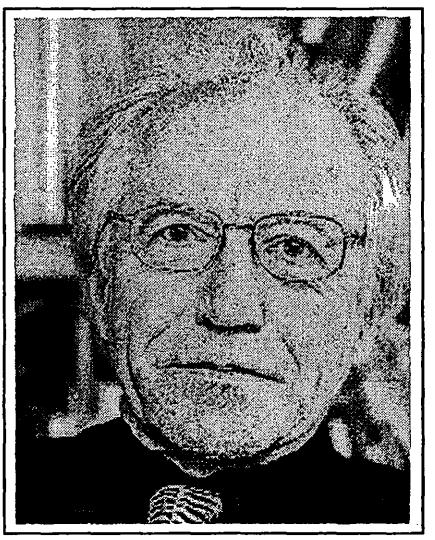
In the years after this second thesis, Ditlev Tamm became to legal historians 'our man in Copenhagen', writing about Danish variations of several general European themes like notaries public or the French revolution. Sometimes these articles were the product of his lectures for the Société Jean Bodin pour l'histoire comparative des institutions, e.g. his study of testaments in the Nordic Countries. That his work always has two faces also becomes clear in his handbooks, of which the main one has two volumes, one about Danish legal history and the other about Roman law and the development of law in Europe (unfortunately only the latter has been translated in English).

As has become clear in this short overview of his bibliography, Ditlev Tamm is a Danish scholar with one eye towards his own country and the other towards Europe. He has been lecturing at several European and Latin American universities and was a guest professor in Kiel. He has spoken at so many international congresses that his foreign colleagues may be forgiven for thinking that Denmark is home to many legal historians, even though for long years Ditlev Tamm was almost alone in researching Danish legal history. Fortunately, thanks to him there will be more Danish legal historians in the future and it is to be hoped that they will follow in his footsteps.

One would do Ditlev Tamm an injustice by thinking he is just a legal historian. He also advises the Danish department of family law, has served as chairman of several official commissions and plays a key role in current debates about church-state relations in Denmark. Needless to say, his academic and social achievements have not gone without recognition. He is a member of the Royal Danish Academy of Sciences and many Danish and foreign academic institutions. For example, he was a member of the supervisory board of the Max Planck Institute for

European legal history and he is also a doctor honoris causa of the University of Helsinki.

That Ditlev Tamm, rooted though he is in his Danish heritage, is willing to look critically to it will become clear to readers of the following article, which deals with the question how Nordic the Nordic legal family really is.



HOW NORDIC IS THE NORDIC LEGAL FAMILY?

Ditlev Tamm

I

The question asked in the headline: "How Nordic is the Nordic legal family?" needs some further explanation. What does "Nordic" mean? And is there really anything like a "Nordic legal family"? I will approach the question by a preliminary story. My second point will be some theoretical reflections and then as a third approach I will analyse a picture.

The story stems from Iceland, a country that nearly has become a metaphor for anything Nordic. One of my favourite authors, the Argentine Jorge Luis Borges in one of his essays said: "In the 13th the Icelanders discovered the novel, the art of Cervantes and Flaubert, and that discovery is just as secret and parted from the world as was their discovery of America".

In the second half of the 13th century an Icelander made up a story about the friendship between two men and the difficulties to their friendship caused by their wives. The story is known today as "The Saga of Njal" and it is one of those marvellous authentic Nordic medieval novels that pretend to describe the life of old Iceland before or shortly after Christianity was introduced. They tell us a lot about the law and even if we must be careful to use them as a source for knowledge of ancient Icelandic law we suppose that they reflect quite correctly how people settled their conflicts in the 13th century when these stories were written down. It is a story of feud and vengeance, of escalating violence, of peaceful settlement and of a sense of law as the basis for order. Njal thus quotes a sentence found in both old Norwegian and old Danish law: "With laws shall our land be built, but with disorder (ólog) laid waste". .

Two women in old Iceland firmly disliked each other and great part of the story deals with the outcome of this mutual dislike. One of the two was Bergthora the wife of Nial who was one of the grand old men of the Iceland in the time of Independence and the key figure in the Saga named after him. The other woman of the story was Halgjerd wife of Gunnar

from a place in southern Iceland called Hlidarende. She was known for her bad temper and her fair hair. Their conflict started when Bergthora at a party asked Halgjerd to move a little for someone else to sit down. The two women started arguing and suddenly they were enemies. The two women even came to dislike each other so much that they not only put a danger to the good relations between their husbands but also came quite close to the acceptable limit of teasing each other. We might say even that they crossed that border. Halgjerd had a man called Kol to help her, and one day she sent him out to kill a slave owned by Bergthora called Svart. Normally in the Sagas some quite brief words rather to the point are spoken on these occasions. Svart was found by Kol cutting wood and therefore Kol when he met him said, that other people too were cutting today and with these words placed his axe in Svart's head.

This incident was bad news for Njal and Gunnar who decided to settle the case in the traditional way in Iceland in such rather tricky cases. It is called *sjalfdóma*, and the idea is, that the person responsible just pays the damages which the other person himself estimated and asks for, and so they did and Nial who probably was aware of what would happen next took the promise from Gunnar that he would not ask higher damages if another similar case should arise and he be the person to ask for damages.

Njal knew his wife and thus had prepared himself for what actually also happened. Hasty revenge was vulgar. Some time has to pass before the grieved person would strike back. Thus Bergthora at a certain moment hired a man called Atle to help in the agricultural business. Atle was tough and did not consider it to be an unfair part of his contract if it included a duty to commit murder. Bergthora one day when Atle asked what he was supposed to do for work today, told him to go and kill the favourite slave of Halgjerd, Kol who had killed Svart. Kol was working in the field, when Atle met him and asked him how working was doing. "None of your business", Kol answered. "You still have the worst left, Death", Atle then said as he ran his spear through Kol.

The two husbands had foreseen the situation and were prepared. Nial had not touched the money which Gunnar had given him to compensate the death af Svart. He gave Gunnar the possibility to estimate himself how much he wanted for damages and Gunnar answered accordingly that he would not ask more than Nial had done. Gunnar got his money, he looked at the silver and saw that it was the same, the Saga tells us knowingly. The two men were still friends but Halgjerd was

angry that Gunnar had made a settlement. She "sneered at him", the saga says, but he and Njal took care and nothing more happened between them that year. But another year would come, matters will escalate and what happens then can be read in the nice old saga of Nial.

As lawyers we are supposed to appreciate how Icelandic literature reflects the law. There is a lot of legal business in the sagas and one of the questions to be asked is whether we ca rely on this information as a testimony of how law was in old Iceland. Most of the Sagas were written down in the 13th century but they tell the stories of people living more than two hundred years earlier. They may tell how law was in Iceland in the 13th century just before Iceland was conquered by the Norwegians and the time of independence brought to an end.

It is however necessary to stress that these spicy stories from the far North are not to be taken as information of neither what Nordic law was or what it is. Iceland is a case of its own. The peculiar institutions, the people and the literature are something very special and very much worth getting acquainted with. When in the following I speak about Nordic law however I do not think of Iceland nor of anything that has to do with Vikings or other famous topics of Northern history. Icelandic law and much more could be said about it was probably the closest we can come to some idea of something specific Nordic At that time quite different from the law of other places in the same way as the old Islandic society had its peculiarities. We meet a peculiar way of dispute settlement in a society with no central government or institutions. In a time when so called ADR, Alternative Dispute Resolution is on the schedule the Sagas remind us also that this idea is in no way new.

II

We come to the second point. Some theoretical reflections.

Iceland was different. Real Nordic - if by Nordic you understand a romantic dream of old Iceland. But Iceland is a case of its own. The Icelandic collection of law the Grágás contains really formalistic and complicated rules especially on procedure. We will now turn to the other old Nordic countries Denmark, Norway and Sweden. Is there anything like a Nordic law is therefore the next question? Is there something like a Nordic legal family, and in case, there is, how Nordic is actually that family. And thus I will turn to the more theoretical part of this lecture. We do have legislation from the 12th and the 13th century, the time of the

Icelandic sagas, in the other Nordic countries and this legislation and the traditions of a peculiar Nordic legal tradition built on them is the theme I will pursue.

Before I turn to the Nordic law however I will briefly make a few methodological commentaries. The first one is a mention of the fact that Legal history and comparative law are two disciplines that have come much closer in later years. It has even been asked: "Is comparative law anything more than legal history?" which might seem a somewhat exaggerated way of expressing the truth that people who use expressions like "legal transplants" or "a new ius commune" or similar expressions to describe what is going on, must have some background in history. Both disciplines are in some ways outsiders at the legal curriculum. The legal historians firmly believe that even if history is not a necessary condition to work as a lawyer today you definitely becomes a better one if you have grasped how law changes from time to time. Legal history is basically looking back into the past, comparative law is looking outside national frontiers but both of them are based on the ideology that a modern lawyer in the 21st century must know more about the world than just the law of the land. Historical comparative law or law in a "historico-comparative perspective" thus is a trend or an approach to both legal history and the history of law.

The concept of legal families has its place in this connexion. It is one of a variety of concepts used, when we try to grasp what we are talking of when it comes to the comparison in law. Legal systems, legal traditions and legal cultures are some of those words that each stress different strings. Order, basic information or in the case of "culture" something that sounds interesting but is hard to define. Legal family is not a very hard core concept either. It reminds us that law and legal concepts are not always too exact.

Legal family is a concept that unites legal systems from very different parts of the world in one group and at the same time it splits up regions and separates neighbours or nearly neighbours from each other. Europe is divided in civil law family and a common law family. The civil law family can even be considered as two families, a French dominated and a German dominated family. Outside this division but in Europe we find the Nordic countries, often neglected or included into the civil law family but also seen as constituting their own family. This is the case in

the *Introduction to Comparative Law* by the German scholars Zweigert and Kötz who dedicate a chapter to what in the English translation is called "The Nordic Legal Family". Those who are familiar with this book will remember how the concept of "style" is introduced in order to distinguish different legal families. The factors – according to Zweigert and Kötz - "crucial for the style of a legal system are first of all its historical background, then follows the predominant mode of thought in legal matters, distinctive institutions, kind of legal sources and ideology". What then is the distinction of Nordic law? A common historical and cultural heritage, the lack of a civil code, a more complicated not too positive attitude towards Roman law, certain lack of formalities and procedure of harmonization within the Nordic countries that has been going on since the end of the 19th century are some common features. Most of all perhaps should be noted a similarity in origin and sources, a common understanding of the law and similar but definitely not identical concepts of how to organize society.

However important differences must also be noted. Especially the difference between the two subgroups into which we can divide Nordic law should be noted. On the one hand Denmark, Norway and Iceland can be grouped together, on the other hand we find an Eastern group consisting of Sweden and Finland. The reason for this division is political. Denmark and Norway were united until 1814 (Denmark and Iceland till 1944) and Sweden and Finland until 1809. Two codes very similar to each other, the Danish and the Norwegian Code from 1683 and 1687 for a long time shaped a common legal foundation of Denmark and Norway. In Sweden and Finland it was the Code of 1734 that formed the common core of the law. So to start with we have two groups of countries and in many ways similar laws especially since the beginning of the 20th century when great parts of Nordic law of obligations and family law was framed into new statutes common to all Nordic countries. Our question again is: Is this law Nordic in a more general sense?

We may add that Nordic law has not been a great contributor to the common foundations of European law. On the other hand Nordic law has developed to a high degree in interaction with European law and legal development. This reception of European law or the legal transplants are the subject of this lecture. Roman law in the North has had less impact less than in many other European countries but more than is often acknowledged.

III

And thus we come to my third point. The picture.

Let us start by looking back unto medieval legislation. In all Nordic countries we find legislation mostly from the 12th and 13th centuries. It will be too complicated to make a detailed comparison of these often quite differently redacted laws, but I think we can limit ourselves to the fact that Norwegian laws do contain the oldest parts going back to the 11th and 12th century whereas the Swedish laws are the youngest. Danish medieval legislation mostly stems from the first part of the 13th century and consists of a body of four written statutes, all in the vernacular. The youngest on is the law of Jutland and of this law we know that it was given by the Danish king Valdemar II.

The law of Jutland is preceded by a prologue that is based on sentences from canon law mostly the *Decretum Gratiani* and also in the law itself we find examples of the influence from medieval canon law. It is one of many examples that shows us how Nordic law was part of a European legal tradition. We find among others the sentence that: "The law shall be honest and just, bearable, in accordance with the customs of the country, appropriate, useful, and unequivocal so that all men may understand what the law provides". This ideal of simplicity it's origin is a quotation from the Spanish church father Isidor of Sevilla from the time around 600. You find it quoted in legislation in Spain and other parts of Europe, but in the Nordic countries you can still hear it mentioned with reference to the law of Jutland pretended to be a true example of the Nordic legal spirit simple and easy to handle in contrast to the complications of other legal systems. An example of how that which is thought to be Nordic is actually part of a European common tradition.

Medieval legislation for more than two centuries played not only an important role in Nordic legal history. Medieval legislation simply was the main field of study. Medieval legislation was considered the core issue of the study of legal history, and even today the question of how to interpret the old laws and how to understand them in a European context remain a challenge to the legal historian. Once medieval legislation could be identified as the heart of the legal history and still in a country like Denmark medieval legislation is closely linked to ideas of national identity. History, language and law come together in the formative years

of Danish nation building in the Middle Ages.

The recognition of Danish medieval law as part of a European history of law is not much more than a hundred years old. The historiography of Danish legal history has moved several steps since in 1769-1776 the Danish legal historian Peder Kofod Ancher published his *En Dansk Lov-Historie* (A History of Danish Law), a chronological study of Danish legislation since the 10th century that still can be considered a rather advanced study for its time. For Kofod Ancher Danish law was part of Danish identity. He only wrote about Danish law, he was proud of that, and he did not raise the question to what extent Danish law was influenced by foreign law. The front cover of his book symbolically pictured Danish law as it was laid down in the Danish Code of 1683 as a tree that was nurtured from roots all being older Danish statutes from medieval and later times.

Kofod Ancher was a reader of European literature of his time. He had found this way of depicting the law in the description of the Law of the Franks in Montesquieu's famous "book of the century", "De L'Esprit des Lois" from 1748. The law is like a tree, at a distance you see its forms, coming closer you get aware of its details but only by digging up its roots you come to a real understanding of life and spirit of that particular law. So was the attitude of the learned baron of La Brède, which also in Denmark was seen as a modern and stimulating way of explaining the importance of history. History and especially legal history was there to tell what was particular in national law. The roots of Danish law according to him were only to be found in old Danish legal sources. The main task of legal history was to find the roots of a specific national way of conceiving the law. Law and national identity thus became related. "I will restrict myself to Danish legislation", Kofod Ancher wrote in his Introduction and so he did. His method was that of a critical researcher even if he did not live up to modern standards. He was reluctant to admit any foreign influence on medieval Danish legislation. One of the chapters of his book was dedicated to the complete refusal that the German *Sachsenspiegel* from the 13th century had had any impact on Danish law. Danish law was according to him a domestic fruit grown in a well protected garden walled against foreign influence.

Today we see the position of Danish law in a European context differently. If one of the questions earlier discussed in the Nordic

countries had been the possible extent of influence from foreign law the situation was now reversed. The position of Nordic law in a general European pattern is now taken as a fact. Nordic medieval legislation forms part of a general movement of legislation in the 13th century. The question today is how to define what was particularly Nordic in the Nordic law once it is stated that these laws do form part of European legal history.

Modern research into the concept of *jus commune* has been an important source of inspiration. The dichotomy of the universal *jus commune* opposed to the local *iura propria* has been refined in later years. It does not make sense anymore to discuss whether the Nordic countries were countries of *jus commune* or not. Roman law was not part of the law of the land but legal thinking influenced from the centres of learning in Southern Europe definitely had a great impact as had canon law on Nordic medieval legal thinking. However it is important to stress that in Nordic legal history the figure of the learned or scientific lawyer only appears in the Middle Ages in the role of a leading ecclesiastical figure. We find very few secular lawyers trained in the lecture halls of great European universities. The opposition of a learned tradition, a scientific laboratory, as it has been called, opposed to an unlearned legal practice has a completely other and much lesser relevance in the Nordic countries than in other European countries. It is a characteristic that should be born in mind that only at late stage – in second half of the 18th century – a legal profession started developing. Till then the law and dispute settlement was in the hands of unlearned judges.

In a not too remote past legal historians would still speak of the idea of "a Germanic law". This concept is not popular today and Nordic law therefore does not not really belong in any legal kinship or specific European legal family any more. Nordic law constitutes its own family as is also recognized by modern legal comparatists like the already mentioned manual by Konrad Zweigert and Hein Kötz. Nordic scholars have to dig out their own past. In this sense the Nordic laws are so much more Nordic today that only Nordic historians and legal historians can be supposed to take more than a distant interest in this old legislation. One of the questions to ask therefore is also whether there really exists a common core of law that can be conceived as specifically Nordic in the old Nordic laws. Is it meaningful to speak of Nordic laws or would it

rather be more convenient to talk of different Danish, Norwegian and Swedish laws which can only be seen as more distant relatives?

A new approach to medieval Nordic law not only has stressed the importance of canon law. Nordic legislation is also now seen as part of a general European trend. At the same time as Nordic laws was written down in Denmark, Norway and Sweden in the Italian city states we find a legal culture "with the most wide-ranging and far-reaching legislation known to the medieval West", as an Italian legal historian proudly says. In Saxony in Northern Germany Eike von Repgow composed his *Sachsenspiegel* that has already been mentioned. England already in the seventh century A.D. had laws corresponding to the Nordic laws and it seems probable that especially old Norwegian law in the way as Norwegian cathedral architecture may have been inspired from England. Other imposing legislative monuments from this same period who partly shows influence from the same European sources as we find in the North are the legislation of the Emperor Federico II of Sicily and the Spanish King Alfonso X el Sabio of Castille.

New ways of looking at the Middle Ages have lead to a rethinking also of the Nordic medieval laws. A new focus on the history of learning and the international community made up by a learned elite in the Middle Ages is another new trend that can lead to a more positive assessment of the contemporary importance of medieval law. Women's studies also is a focus of enthusiastic approach to Nordic medieval legal texts even if they are not too eloquent. To this should be added the history of family and kinship that also sheds new light over old legal texts. The ideas of kinship (Sippe) as one of the dominant institutions in old medieval law as already mentioned is also one of those that are contested today. Researchers point to other networks similar to the Roman concepts of *clientela* and *amicitia* as dominant in Nordic medieval history since the 12th century. Still others point to the importance of canon law and the rules on forbidden grades in matrimonial law for the establishment of a coherent system of kinship relations in the Nordic countries. If we accept that the Nordic laws have to be seen as a part of a European project also investigation into medieval legal institutions in France and Italy may shed light on Nordic law..

A cautious approach to the medieval laws as a reflection of old customary

law has been prevailing in Danish legal history. The idea that in the written sources we find expressions of very old law has been abandoned. The old law must be understood as a writing down of contemporary law that does not necessarily base itself on older law. Thus the field is open for the acceptance of a reception of a new legal culture and a complete change of the legal pattern at the time of the redaction of these laws in the late 12th and the first and second halves of the 13th century. Nordic law therefore cannot be categorized as "Germanic" law in any scientific sense of the word. Later scholars of Nordic medieval law have even more stressed that the medieval laws are not of a very old date but have to be seen as testimonies of a legal concern that had to do with the shaping of a new society around 1200. The question is to which degree it makes sense to talk about a "Nordic" law of medieval times. Therefore the question: "How Nordic are the Nordic laws?"

The time has gone when legal historians dedicate themselves only to the investigation of legal questions related to medieval legislation is over. The time therefore has come to consider what has been achieved and to discuss new ways of understanding Nordic law in the Middle Ages. As a Danish historian, Michael H. Gelting puts it: "Our main source for Scandinavian social structures in the high Middle Ages, the twelfth- and thirteenth-century law books, must be interpreted as a part of a common European trend to create a new kind of social order and predictability through comprehensive and systematic legislation"

IV

I come to my next point - the fourth – that has to do with the influence of Roman law in Denmark. Again we can use a picture: A stone set in the gateway of the town of Rendsborg in Slesvig in the most southern part of old Denmark marked the northern most limit of the Holy Roman Empire to which Denmark did not belong. The stone carried an inscription in Latin that stated *Eidora Romani terminus imperii* – the river Ejder is the limit of the Roman Empire. This inscription tells us not only that the river Ejder, which used to separate the Germans from the Danes, was the Northern frontier of the Roman Empire it also in many ways illustrates the separate position of Nordic law and its peculiar relation to Roman law.

There was a time when it was only reluctantly admitted that Danish law was influenced from Roman law or other foreign laws. In the 18th

century it was often denied that Roman law had had any significant impact on the development of what was supposed to be pure Danish law. Such was as you may already have grasped the view in the work of Peder Kofod Ancher on the history of Danish law. Kofod Ancher was too emphatic when he reduced the importance of Roman law in Denmark, but he was right in as far the old laws had been a conservative weapon in the hands of those who were against changes in the law. We see that already in a document from 1282 in which references the the "law of King Valdemar" are used to restrict the king's legislative power. In legal practice as we know it from the 16th century and onwards the old laws are clearly seen as the fundament of the law and as a protection of existing rights that should not be changed without good reason.

It was the great Danish 19th century lawyer Anders Sandøe Ørsted who in 1822 stated that such a point of view was to be considered as an "exaggerated patriotism". He in a time that did not acknowledge the importance of the concept of *jus commune* referred himself to certain examples of impact from Roman law especially within the field of family law and the law of obligations. His main argument however was the basic value of Roman law as the foundation of any scientific method in the law. Since that time it has been generally recognized that Danish law was influenced by methods and institutions of Roman law. Denmark was not divided by the schools of Romanists and Germanists. Roman law was taught at the university of Copenhagen since its foundation in 1479. It was expressly stated in the statute of the reformed University 1539 that by studying Roman law the students would learn the spirit of the law and justice in general and in that way be able to judge whether local Danish law corresponded to these general principles even in another way than Roman law did.

There is however no Danish parallel to the discussion of the " the reception of Roman law, which the Germanist Beseler in his *Volksrecht und Juristenrecht* considered a German national disaster, "a Nationalunglück. In Danish legal history Roman law still did not play an important role. However gradually canon law as we have seen was understood as a system that played an important role in the Middle Ages. The interplay between Church and Society led to a great influence that was especially seen in matrimonial law. However in a protestant country it seemed difficult to admit the general civilizing force of the Church and

of canon law. Several papal decretals addressed to Nordic archbishops were known, but it was only in 1890ies that canon law was understood as a coherent system of law worthy of its own study that could lead to important conclusions about Danish law.

Legal history in the Nordic countries has not been in the need to invent a legal past in order to find a national law. The medieval laws were such a past. And at least since the time of Kofod Ancher it has also been recognized by legal historians that there are such similarities between the medieval laws of the Nordic countries that the study of the laws of one of the other countries must be considered as useful for the understanding of medieval Nordic law in general.

This statement leads me to another point, then creation in modern times of a common Nordic law. As I told you the Nordic countries were divided into a Danish-Norwegian and a Swedish-Finnish branch and there was little relation between them in the filed of law. It was only later that the community of legal ideas found in the Nordic countries was given a high priority. It happened when in 1872 a first meeting between Nordic lawyers was convoked in order to discuss legislative questions of common interest. The inspiration to convoke such meeting came from similar meetings in England and Germany. The chief aim of making such meetings was to find a common legal path that could lead to other solutions than those found in German law. The year 1872 may be seen as the year of the birth not only of Nordic legal cooperation in the field of law but also as the year in which the idea of a legal unity the Nordic countries was born independently of historical differences.

V

Before entering into the field of Nordic legal cooperation it would like to introduce some specific features of Nordic law. One of them is that there is no civil code as today in most civil law systems. However there used to be codes and in Sweden still the old code from 1734 lies behind the system. In Denmark and Norway it is different. In 1660 Absolutism was introduced in Denmark and Norway and some twenty years later a Danish and a Norwegian code were enacted. Absolutism was legitimized by a specific Act the lex Regia that was incorporated into the Danish code but generally it was no reform code. A great part of its about 1800 articles

had their origin in older legislation as we saw on the picture from Kofod Anchers book on Danish legal history. The Danish Code was enacted in 1683 and four years later a Norwegian code was enacted that did not base itself on old Norwegian but had the Danish code as its model. The codes was divided into six books on procedure, law of the church, family law and laws on the different estates, sea law and criminal law. A friend of this old code was Jeremy Bentham who in his *A General View of a Complete Code of Laws* praised it: "Of all the Codes which legislators have considered complete, there is not one that is so. The Danish Code is the most ancient code... In the preface to the Danish code, it is expressly stated to be complete". Bentham can mention several fileds of law not mentioned in the code, but still he concludes: "It is however, the least incomplete of all the codes".

The Danish code apart from around a hundred articles is not any more in active force. It contains some basic principles still maintained as the duty to live up to promises and agreements or to restore goods which have been stolen or hired out against the will of the owner. The code however came too early to survive. Legal science under the influence of Natural law made enormous progress in the 18th century and Danish courts were not sufficiently guided by the code. Natural law was needed to fill out the gas of the law that thus developed besides the code. Also new legislation was issued that was not inserted in the code even it treated matters governed by the code. We therefore since the 18th century witness a process of decodification that has not later been remedied.

The Swedish Code of 1734 was also the law of Finland. Also in Sweden Natural law had a great impact. IN the 1660ies a new Swedish University was founded I Lund and one of the first professors of law was Samuel Pufendorf who became one of the leading European authorities in the field. His *De jure naturae et gentium* from 1672.was printed in Lund. However the presence of Pufendorf in the North was not sufficient to found a Nordic school of natural law.

Neither the Danish nor the Swedish code had modern successors. In Denmark it was discussed in the 1830'ies whether a new code should be made but the idea was discarded. The reason that no code was made was the influence from the German historical school and the opposition of F.C. von Savigny against a code. Time was not ripe for a code and Denmark was too far from France to discuss an adoption or reception of

the French code. The law should be permitted to develop itself organically and not be kept in a stiff system of a code was his argument that was also quoted in Denmark. The result was: No code and Norwegian and Swedish preparations for a code had a negative outcome.

I hope that from what has been said it is clear that Nordic law was not in modern times isolated from the general trends of European. This was evident when we consider the importance of natural law and also for legal education the German way of studying Roman law, the *usus modernus pandectarrum*. Denmark had close links to Northern Germany and German was a language commonly spoken I Denmark. Around 1800 Danish legal science was highly improved by a Danish lawyer Anders Sandøe Ørsted who was widely read in German legal science and who had also studied the Code civil and the other contemporary codes: "In all fields a study of foreign law may in many respects be useful to anyone wishing to acquire a complete insight into the current law", he said and thus acknowledged the importance of comparative law for the understanding of Danish law. Since his time Danish law
And legal science has had its own history. German legal science however still had a great impact as was also the case in Sweden whereas the Norwegians were less impressed by German law professors and their methods. Thus Danish law in its system and terminology has come close to civil law but still maintained its independence. There is no parallel to Belgian law teaching based on French sources. German law and Danish law (and the law of the other Nordic countries) is quite distinct and of course even more so after the enactment of a German civil code.

VI

Denmark is one of those small nation-states that more or less by miracle have survived until today despite wars with a dominant Sweden and later an even more dominant Prussia and Germany. However a strong Danish national identity was created especially confronting German nationalism in the 19th century. After 1871 the founding of a second German Reich was one of the factors that brought the Nordic countries closer together. It started in the 1830ies. Denmark-Norway and Sweden
were born enemies but now that came to a close. Students and poets and politicians started a Scandinavian movement of collaboration. It never lead to a political union but an important outcome was collaboration in

the field of law that was inspired by industrialism and internationalism but also the understanding of the importance of not being too small in modern world. The Nordic countries apart were not big but together they were something and out of this conviction was started a permanent work on harmonization of the law since 1872. Commercial law, the law of the sea, bills of exchange and checks were some of the subject and after 1900 the work was continued into vast fields of the law of obligations, especially sale and contracts in general and also into the field of family law. Law professors from the Nordic countries worked together and in general legislation was made in a Nordic spirit that has only been slowed somewhat down since the 1970ies. The Swedish minister of justice at that time announced that Sweden wanted to make reforms at their own faster speed. Also the membership of the European Community had had an impact as great part of the legislation is now made within the European community framework. Anyhow the importance of Nordic cooperation for the creation of something like a Nordic legal family should not be underestimated. As you will have appreciated there are common features in older law but it was only in modern times that the Danish-Norwegian and the Swedish-Finnish law family really merged.

VII

Even if we may conclude that in the field of private there is something like a Nordic legal family there are still in many files of the law important differences. Today all Nordic countries consider themselves "Welfare States" with a high level of state regulation and a sophisticated system of social aid. In Europe it is often called "the Swedish model" and in some ways the Swedish dominant Social-democratic party marked the way but the development in Denmark and Norway have been very similar to Sweden. Characteristic is also the level of taxation and the principle that social aid basically is not financed by your own savings but by taxes. This said it should be pointed out that there are many differences in the field of public due to very different historical conditions.

I will mention two examples, the constitution and the relation between church and state.

Norway was the first Nordic country to have a modern written constitution. It happened in 1814 at a moment when Norway was on its

way to independence from Denmark. Norway at that time however did not become an independent state but was united with Sweden until 1905. The constitution however was recognized by the Swedish king and thus the political relation between Norway and Sweden was completely different from the Danish-Norwegian relation in an absolute monarchy. Norway developed immensely in those years and created its own political institutions.

Denmark still was an absolute monarchy until 1848 when liberals convinced a new king to appoint a liberal government and start the work of making a constitution. The draft for the constitution was made by a member of the government basing himself very much on a selection of translations of foreign constitutions. The Belgian constitution from 1831 at that time was seen as a model constitution and it was the only the foreign constitution that was especially imitated in Denmark. The position of the King in the Belgian Constitution, the Bill of Rights was more or less copied as was also the system adopted by the Belgian constitution regarding the preparation of the budget law and the principle that taxes could only be demanded on a yearly legal basis. Denmark thus was one of the countries to which the decisive year of 1848 played a major role.

In Sweden it was different. Sweden had no revolution in 1848 and only in 1866 changed the old Estate constitution into a modern constitution based on the principle of two chambers.

Danish constitutional tradition has been to change as little as possible in the constitution. However at certain moments in 1866, 1915 and 1953 the constitution was reissued due to major political changes. The loss of Slesvig-Holstein, a change in the relation between the chambers, women's right to vote and finally the abolition of the first chamber were the reasons for a change, but still basically the Danish constitution is a 19th century constitution with few articles and an old fashioned bill of right that was supplemented In 1992 by the incorporation into Danish law of the European Convention on Human Rights. Again an example of how European countries come closer.

Norway also keeps a conservative constitution. Any changes are made in the old language of the constitution from 1814 that is nearly pure Danish. The Swedes in 1975 made a radically new constitution.

Church and state is another field in which different approaches can be appreciated within a common framework. Denmark and Norway had a Lutheran reformation in the 1530ies that meant that Catholicism was completely abolished. The catholic priest became Lutheran ministers. Only the bishops had to be substituted by new ones.
In Sweden a Lutheran reformation was imposed by the King Gutav Vasa, but it was only in the 1590ies that the Lutheran Faith was officially acknowledged and the catholic faith still due to dynastic reasons played a more important role. The Danish church was reorganised as a German princely church (Fürstenkirche). The King was not an archbishop but he had to power to organise the church and it was his duty not only to supervise the church and the faith but also to take action in ecclesiastical matters. No other religion than Lutheran Protestantism was allowed and so it continued until 1849.

In the constitution was introduced the idea of a "Popular Church" as a denomination for the church to which the great majority of Danes belonged. The church was and is still regulated by ordinary parliamentary statutes. The government appoints a minister responsible for church affairs. There is no head of the church apart from the queen. There are no assemblies or other ecclesiastical for a. The church thus continues to be integrated into the state. There is in Denmark no separation between state and church which may seem odd in a modern country but has to be understood on a historical background. So it was in 1536 and even if other religion have moved in the majority of the population is still member of the official church.

In Norway the church ia a state church but it has become more independent due to a system of parliamentary organ on different levels within the church. A similar position is taken in Finland whereas the Swedish church since the year 2000 has been separated from the state. Again we must give historical reasons. The church in Sweden was a separate estate and thus a long tradition of political independence even if still as a state church.

Different positions in countries that in other aspects may look similar.

Conclusive remarks

I come to a conclusion:

Continuity, national identity, no trained lawyers until late, that Roman law was never the law of the land, European interaction, influence from German Pandektenrecht, Nordic collaboration, a certain informality, legislation as a means to govern society, state intervention, high taxation, welfare state. These are some of the words that might define a specific Nordic family. And especially stress the late arrival of trained lawyers and legal science. I think it is just to speak of such a family as distinct from both civil law and common law. It is more like civil law than common law in the way of legal reasoning but still different. Even if the Nordic countries are more different that it may appear there are similarities that go way back into the Middle Ages when relation between the Nordic countries were strong. For a short period from 1397 until up in the 15th century the Nordic countries were united but since 1500 fell apart. Only in the 19th century did collaboration start again with the result that the Nordic countries came close in structure and law. But they are different and I am afraid that they in some ways become more separated. Danes, Norwegians and Swedes do not understand the languages of the other Nordic countries as they did before. English that was never a lingua franca in the North however now moves in as a signal that we are actually part of a much bigger community.

There is a long way to go before European law will be harmonized and I hope I have sown that even within a region like the Nordic countries there are similarities but also great variations. I like myself the idea of a diversified Europe but as a historian of law I also like tradition. The position of the Nordic countries in the field of European harmonisation of the law is pragmatic. No great problem is seen in adapting the law of the European Union. Politically there is still some reluctance against what is seen as too much union. I think that the understanding of legal history and the attitudes in the North towards the law also explain but in my view not excuse the peculiarities of the somewhat hesitating position of most of the Nordic countries and the in the European Union.

Laudatio Frans GREGERSEN

Godelieve. Laureys

Frans Gregersen was born in 1949 in Copenhagen. He studied Linguistics and Psychology of Language at the University of Copenhagen. After his studies Gregersen started his career as a researcher and later as an associate professor at the Institute of Nordic Philology and the Institute of Danish Dialectology of the University of Copenhagen. In 1996 he was appointed full professor of the Danish language at the Institute of Nordic Philology. He was elected to the Royal Academy of Sciences in 1997 and currently serves as a member of its committee on research policy. Earlier on he had already served as a member of the Council for the Humanities at the Ministry of Education. From 1996 to 2001 he was a member of the Danish Research Council for the Humanities and he has continuously been active as a Ph.D. supervisor and educator, serving as vice chairman and later chairman of the board of Ph. D. studies at the University of Copenhagen. Since 2001 Frans Gregersen has been director of the Graduate School of Language Sciences in the Copenhagen region (www.gradeast.dk) financed by the Danish Academy.

His research covers two main areas. On the one hand Frans Gregersen has applied himself to the study of Danish structuralism and in particular to Louis Hjelmslev's theory and its influence on Danish linguistics. This was also the subject of his doctoral dissertation, *Sociolingvistikkens (u)mulighed,* [The (im)possibility of Sociolinguistics], which he defended in 1991. Even earlier writings show that he has a great interest and is well-educated in the theory of language and in the history of the area of linguistics in general, as well as of Danish linguistics in particular. Together with Simo Køppe he published a book on 'Geistesgeschichte' and the theory and history of the humanities, *Videnskab og lidenskab,* [Scholarship and Passion] (mark the pun in the Danish title), as early as 1985. Other important books followed soon, such as *Against epistemological relativism, History and Philosophy of Science* (1988), as well as the two volumes *Idehistorie,* [History of Ideas]. Thus it is beyond any dispute that Frans Gregersen is an eminent

candidate for the Sarton medallion.

On the other hand Frans Gregersen has won his spurs as a sociolinguist. In this respect *the Copenhagen Project in Urban Sociolinguistics I-II*, which he directed together with Inge Lise Pedersen from 1986 to 1991, can particularly be regarded as pioneering work.
In 1998 Frans Gregersen was appointed director of the Øresund project, a joint effort by Danish and Swedish universities financed by the EU and focussing on the development of pedagogical and didactic skills of native language teachers. In collaboration with the university of Lund this project resulted in a number of new research projects, among which an investigation on the phonetic distance and the mutual language understanding between Danish and Swedish.

Frans Gregersen has always displayed a broad active interest in the so called 'Verständnis des Faches', the identity and positioning of the discipline. Closely connected with this are a great reflection and meta-approach of native language didactics. This was expressed early on in a project such as *Skolesprog,* [Language at School], (1974-1979). From 2001 to 2003 Frans Gregersen chaired a group commissioned by the Ministry of Education to renew the school and university subject of Danish. The result was the publication of *Fremtidens danskfag,* [The future of Danish as an academic subject], in March 2003. To this end, Frans Gregersen arranged several discussion fora, in which all the actors in the field could enter into a discussion with each other.

Frans Gregersen has an impressive list of publications, which both reveal his broad intellectual scope and testify of his methodological unrest and depth. He has published in all major Danish periodicals and in international journals such as *Soziolinguistica*, *Culture and Society*, *Acta Linguistica, International Journal of Sociolinguistics* and he has written contributions to the *Encyclopedia of Languages and Linguistics*.

Frans Gregersen has been a member and chairman of several evaluation committees in and outside of the Nordic countries. Recently he has been appointed chairman of the Nordic Language Council, which makes him into a key figure of the language policy of the Nordic countries. From May 2005 onwards, Frans Gregersen is the director of the Danish National Research Foundation Centre on Language Change in Real Time (the LANCHART centre) at the University of Copenhagen (www.hum.ku.dk/lanchart).

To sum up, I quote from *The History of Linguistics in the Nordic Countries* by Even Hovdhaugen et al.

> As a central figure in the promotion of various aspects of linguistics in Denmark, Frans Gregersen has not only been a productive scholar in a number of areas, but has also been active in promoting educational reforms and research policy making, in editing books and journals, and in planning and supervising two major research projects in sociolinguistics (6.3.11). Both projects have furthered research in the spoken language and have served to recruit and train young scholars in linguistics. Gregersen has also been instrumental in organizing a doctoral program in linguistics at the University of Copenhagen and in planning courses for doctoral students throughout Denmark. Recognizing the acute need in Denmark to educate a new generation of linguists, he has recently organized a forum for discussing ways to improve the recruiting of candidates of language studies." (Hovdhaugen et al. 2000: 507).

I met Frans Gregersen for the first time during my studies at the university of Copenhagen in 1970-71. Together we took our first steps in Danish linguistics under the guidance of Prof. Em. Erik Hansen.
During my professorship at Groningen University, I arranged a symposium in 1989, devoted to the linguistic development in the Nordic capital cities at the university of Groningen. From all Nordic countries, speakers were invited to report on ongoing research ant to develop a comparative perspective. I found it obvious that Frans Gregersen would be the ideal person to report on the Danish state of the art.
Ever since, Frans Gregersen and I have maintained close research connections. These contacts were particularly intensified when we started the Dutch-Danish dictionary project at our department in Ghent. The Danish database which resulted from this project, offers broad perspectives for further contrastive lexical and syntactic research between our two languages. It is then my strong desire that we shall be able to collaborate even closer in the near future.

ON RECONSTRUCTION

Frans Gregersen

It is thoroughly conventional to begin this lecture by professing my profound gratitude of being bestowed with this honour. There is, however, believe me, nothing conventional in how I feel by having my humble name being connected with the gigantic figure of George Sarton. From Sarton and I. Bernard Cohen a line may be drawn to Thomas S. Kuhn whose work on paradigms has been deeply inspirational to everyone including me, but that is, I think, the extent to which I may claim any influence from Sarton on my practice as a historian of science. Yet, I seek a certain comfort in the fact that for Sarton, the history and philosophy of science and the sociology of science are not separate endeavours. Isis, the journal he founded was to be and I quote

> " at once the philosophical journal of the scientists and the scientific journal of the philosophers, the historical journal of the scientists and the scientific journal of the historians, the sociological journal of the scientists and the scientific journal of the sociologists" (Sarton, 1959: 69, quoted in Garfield 1985: 245).

Today, I will be concerned with a topic which I have only begun to exploit, and thus I will be concerned *not* with the history of the idea of reconstruction. The history of reconstruction has recently been the subject of an impressive paper by Jeroen van Pottelberge of this university, and I am happy to refer you to this paper and the extended references there for a brillant account. I will only be concerned here with the *logic* of reconstruction. This is because I shall argue that the logic of reconstruction may give us a glimpse of the enigmatic nature of historicity as such, and I hope to show you that reconstruction merits a thorough study which will unite the various uses that this practice has been put to, and still is put to. In studying the practice of reconstruction in detail, I hope to live up to the famous phrase that Ferdinand de Saussure used in a letter to Antoine Meillet in which he laid out the purpose of the

book he would be trying to finish as 'montrer au linguiste ce qu'il fait'. I hope to show you some of the things we do, when we reconstruct.

1. Delimitation of the problem

For reconstruction to become a viable practice at all, you need at least two preconditions (cf.Van Pottelberge 2003:307): First we need some elements which are considered variants of the same. In the case of manuscripts, this is often on the face of it trivial since some of them have actually been catalogued as being 'the same' in the sense that they contain the same text. Take for instance the histories of Livy or the letters of Cicero to his friend Atticus. Since a cursory inspection of the manuscripts themselves will show that they are *not* the same in the sense that what in one manuscript is the text of a certain letter from Cicero in the other does not contain the same words, the same letters, the same letter types and so on and so forth, we may conclude that there is variation. Variation, on the other hand, only makes sense if there is some notion of sameness involved.

The other precondition is *a sense of history*, or more precisely *a sense of change*. This makes it possible to arrange the variants as participating in an evolution and very often it leads to the notion of authenticity. I stress this point since this has recently been denied as the basis of philology in the so-called new philology with its *éloge de la variante*. I shall come back to this later.

Take again the Cicero letter. We speculate that if this is really a letter from Cicero to his friend Atticus, then Cicero must have sat down to write a specific wording which is then to be considered the authentic version of the Cicero letter. In some cases, we do indeed have the authentic or original version - but then there is, alas, no need for philology! In most cases, however, the philologist feels compelled by the fact that there are several variants of one and 'the same' text. Which is the true one, or the better one? he or she asks.

So we have to have our two preconditions in place, and then we can start the reconstruction process ultimately resulting in a reconstruction. Reconstruction may then be defined as the systematic

search for - that is *the process of reconstructing* - and the finalized result of, that is *the product of reconstruction*, of the authentic, or the first, or the best, version of the element in question. Note that we have both a process of reconstruction and a result of the process which is the reconstructed item. In this broad sense, reconstruction is a tool used in all the historical sciences, whether they be concerned with texts, musical scores, archaeological remains or historical facts in general.

2. Example 1: Indo European comparative linguistics with special emphasis on August Schleicher

Indo-European comparative linguistics stands out as the gigantic effort of the historical 19th Century and has been seen as the most brillant result of any human science. Part of its success lies in the use of the tool of reconstruction. But one might well ask whether the preconditions were met at the start of the century, i.e when Rask, Bopp and Grimm actually founded the science of comparative linguistics. I have only studied Rask, so I shall limit my introductory remarks to him in order to elucidate the early history. Obviously, we have in this case to meet precondition one, to see the various languages as variants of a same, before we can progress any further. And this was not an easy task. The huge masses of evidence amassed by Pallas and Adelung did not order themselves neatly in families and subfamilies, it took the methodical and systematic genius of a Rask (1787-1832) to discover the relationships. I shall not go into details here, just note that there is an important logical difference between ordering languages in families - so that we know which languages are versions of 'the same' - and reconstructing the ancestor which they are supposed to be variants of, and the reason I underline this is that Rask did not take this last step[1], only prepared it for later generations. In fact, his prize essay, which has recently been elegantly translated into English by my first teacher of linguistics Niels Ege, aims at ordering the relationships between old Norse and the neighbouring languages, and only Rask's vast knowledge brought him to provinces as distant as Indo-Iranian, so that the picture he ends up drawing, stunningly reminds us of

[1] Van Pottelberge 2003: 318 notes that Bopp did not either: "Das letzte Ziel war für Bopp die Etymologie der Beugungsformen, nicht die Wiederherstellung einer Ursprache".

later *Stammbäume.*

So the difference between the historical 19th Century and the previous ones was not that the previous researchers had not speculated on a possible unity behind the many different languages, but rather that they had sought the mother tongue of all mother tongues, as it were, in the Bible, pointing to Hebrew, or in their own national pride, thus pointing to whichever language they happened to speak themselves.

With August Schleicher (1821-68) Indo European comparative linguistics enters a new stage and actually this new step brought it to the centre stage of contemporary historical sciences. This is a paradox, since Schleicher firmly believes that Indo European linguistics is not a historical science at all. Listen to his words in his 1850 treatise on *Die Sprachen Europas in systematischer Übersicht*:

> "Der Philolog hat es mit der Geschichte zu thun, die eben da anhebt, wo der freie menschliche Wille sich Dasein giebt, das Object der Linguistik dagegen ist die Sprache, deren Beschaffenheit eben so sehr ausserhalb der Willensbestimmung des Einzelnen liegt, als es z. B. der Nachtigall unmöglich ist ihr Lied mit dem der Lerche zu vertauschen. Das aber, woran der freie Wille des Menschen so wenig in organischer Weise etwas zu ändern vermag, als an seiner leiblichen Beschaffenheit, gehört nicht an das Gebiet des freien Geistes, sondern in jenes der Natur.
>
> Demzufolge ist auch die Methode der Linguistik von der aller Geschichtswissenschaften total verschieden und schliesst sich wesentlich der Methode der übrigen Naturwissenschaften an."
> Schleicher 1850:2

Collinge in his brief history of comparative linguistics in the Encyclopedia of Languages and Linguistics (Asher 1994) has drawn attention to the fact that there are various logically different strains of thought involved and that in the early period of comparative Indo European linguistics, they were conflated in interesting ways. Collinge distinguishes first a T-strain. T stands for typology. This strain is concerned with the structure of language irrespective of historical

relationship, i.e. what we now call language typology. The gospel of analytic languages, having only roots as words, agglutinative languages, where endings are so-to-speak glued onto roots, and finally inflectional, or fusional, languages where the root and the endings are so interwoven that it is difficult to separate them, is the typological Old Testament.

Secondly, the E-strain - for Evolution. This leads to generalizations of the development of actual forms or changes between stages of languages finally resulting in universal statements of permissible developments. This is more like present day grammaticalization theory.

Finally, the G-strain is the well known genetic investigation of which languages are historically related to which other languages. It is mostly with this G-strain I shall be concerned today, but the interesting thing about August Schleicher is that his stance is a very ingenious mix of strains rolled into a unitary theory.

Schleicher introduces his topic with some sweeping statements about the function and historicity of language. The essence of language is to express meaning ('Bedeutung') and relation ('Beziehung'), and the particular nature of a specific language is evident in how it performs this function. Now, meaning resides in roots, whereas relation is expressed by endings or what would later be called grammatical morphemes, and of course syntax. This gives the clue to the particular fusion of the T-strain with the E-strain and the G-strain in Schleicher: he insists that the analytical languages where a root can make up a free linguistic element, with Chinese as the prime example, are the oldest ones, but that the development of language goes from that stage through the stage of agglutination and resulting in the final and most refined stage, that of inflexion. Prime examples of inflecting languages are Sanskrit and Latin. Now, it has not escaped Schleicher that the modern languages all tend to revive some sort of analyticity or agglutination and that leads him to a final and most influential conclusion, viz. that prehistory led to perfection, but that history is the witness to the ever present decay of languages. History and prehistory is in this sense the opposite of each other: Prehistory led to the perfection that history undid.

It took all the polemical talent of an Otto Jespersen to dispose of

this notion of the Golden Age lying far behind us (Jespersen 1891: in particular 11ff). In his vindication of the modern languages, Jespersen, just as lopsidedly, argued that history on the contrary led to perfection, in that English had dropped all the cumbersome and tedious stuff at the end of the words - and had become all the more effective for it. If Schleicher had appealed to the nature of language and had maintained that linguistics was a natural science, Jespersen trumped by calling upon a more or less vulgar version of Darwinism[2]: Language evolved and only the fittest survived. English was alive and kicking, whereas Latin and Sanskrit weren't. Hence, English was the more fit for life.

August Schleicher, according to most informed observers (most prominently K.F.K.Koerner 1983 and Van Pottelberge 2003), forged the paradigm that was to form the backbone of comparative Indo European linguistics. I reconstruct it as involving the following steps:

1. Only comparative research can lead to anything but before you can compare you have to be sure that you have to do with likes. Only likes may be compared.

2. Make every effort to get to the earliest attested stage of the language before you compare it with anything at all.

3. Now analyse the forms of the language: separate the roots from the endings and take care to isolate each ending so that it corresponds to a minimum of meaning.

4. List the roots and order them so that their meanings and their expressions are ordered separately.

5. Compare the lists with equivalent lists for the other languages and take care to compare only forms that have explainable resemblances.

6. Resemblances may be explained by sound laws as to the expression and by reasoned etymologies as to the meanings.

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[2] Cf. Diderichsen 1958 (1966), in particular section 9

7. Now conclude as to which resemblances are closer than others and by this move create subclasses, classes and families.

8. In this way, you are able to reconstruct an earlier version of what you have chosen to compare, thus working your way downwards towards the distant past.

There are of course, numerous pitfalls in this procedure, but I am not concerned with them here. Rather, I want to lay bare the logic of the endeavour. The *modus operandi* is as stated to work backwards, taking care each time to group only languages which resemble each other in some specified respect and then adhering to the same principles all the way down, as it were. But the interesting thing is that for the modern mind (and I might add for the general public) the construction of the reconstruction has been so successful that we tend to take it for granted. Hence, we believe that the reconstructed forms actually *explain* the attested forms, whereas it is in fact the other way round. We *posit* the existence of the reconstructed forms in order to be able to unify certain characteristics of the forms we have picked out for analysis. We might rather say that this is the way we try to *account for* the forms.

3. Example 2. Indo European comparative linguistics 2: The reconstruction of the laryngeals by de Saussure

Schleicher's reconstructions have thus attained a reality never anticipated, I am sure, by their inventor. Volumes of etymology, thousands of dictionaries and libraries of treatises have hammered out the success of the Indo European reconstruction. By now, we think that we know all this - it has become an accepted reality. Thus, it was a revolutionary moment in the history of the discipline when Ferdinand de Saussure (1857-1913), with his 21 years being even younger than Schleicher himself when he wrote his 1850 work, in his *Mémoire sur le système primitif des voyelles dans les langues indo-européennes* from 1878, reconstructed formulas for which he claimed no reality at all. Only years later, much later, the reconstructed coefficients, as de Saussure called them, would turn out to be manifested in the then unknown Hittite language. The story goes like this:

In order to create some order in the inflectional paradigms in the

reconstructed Indo European, de Saussure notes that certain forms may be accounted for if we posit a *coéfficient sonantique* which regulates the emergence of the Ablaut vowel as *e, *o, or nil. These coefficients are not themselves sounds but elements which regulate the Ablaut process and thus so to speak colour the vowel.

The theoretical implications of this move are enormous and while the *Mémoire* was immediately hailed as a major contribution to scholarship in general, and to the knowledge of the early Indo European vowel system in particular, it would apparently last until the advent of structuralism until de Saussure's insights got the proper recognition. They deserve to be mentioned here precisely because they show that the method itself does not stop you from reconstructing elements which you only know by their function, or their effect on other more substantial elements. It is crucial that the novelty is precisely *not* that the reconstructed elements turned out to have counterparts in Hittite - it is the other way around: Precisely because he did not care at all whether they had ever had an expression, de Saussure got it right. They were necessary elements even if they had never been found.

In this way, de Saussure paved the way for the deep reconstructions of recent years, reconstructions which try to combine what we know of prehistory from archaeology and geology with the results of following through on Schleicher's comparative endeavour.

4. From classical philology to New philology

Some observers have hinted that the young August Schleicher got his rigorous method from his studying philology with Nitschl (Koerner 1983:XLIX, quoting Dietze 1966:18) and it is a tempting suggestion to follow up[3]. If we go back to the original schema of reconstruction:

First, consider the variants, then compare them, taking care to

[3] Van Pottelberge gives some interesting examples showing that both Georg Curtius and Michel Bréal used the similarities between the two kinds of linguistics, probably in order to persuade the classical philologists that comparative Indo European was not such a strange animal at all (Van Pottelberge 2003:318f).

order them as faithfully as possible with the chronologically older ones as the most worthy exemplars, and on the basis of this comparison then reconstruct the earlier version - this accords, of course, very well with what philologists do. In this brief section, I shall try to bring out the resemblances and the differences.

First, remember, if you please, that for Schleicher all philology remained a historical discipline, whereas linguistics was a natural science. For Schleicher, the advent of writing seems to have marked the advent of decline. For the philologists, however, the advent of writing means business. The industry of editing texts traces its origins back to Alexandria when the earliest commentators on Homeric texts explained the meaning of various words. As with comparative reconstruction, it needs to be stressed that the logic of stemmatology, i.e. the invention of a reconstructed text from which all known texts stem, marks the *qualitative* difference between the scientific philological procedure of modern times, which in this case means from historicism and onwards, and, on the other hand, the practice of emendation and correction so characteristic of earlier practice. The work by the researchers from the Renaissance who purged the Bible of the many translation errors was, I gather, driven by the same intentions of creating a pure and uncorrupted text as present day critics, but they did not have in their tool box the reconstruction of an otherwise unknown X, the mother manuscript of all its fragile and corrupted offspring.

We see here the same qualitative leap when the philologists posit an unknown version to account for the known ones in a systematic fashion, as we did with the Schleicherian reconstruction of an unknown and unattested Indo European mother tongue to account for all the known languages of the same family.

The philologists study texts. Some of these texts have literary qualities which actualize aesthetic judgements. Which text is the better one? Some of the texts have historical importance and the history of a nation may depend upon a single word in one of them. Small wonder that philologists take every care to reconstruct only the authentic text. Now, this would not have been worth the mention if a new version of philology had not come into existence which denies the very preconditions which

the earlier practice was based on, first and foremost the idea of authenticity. Through the work of scholars such as Cerquiglini and Stephen G. Nichols, a paradigm has been created which insists that, at least for the Middle Ages, the idea of a unique mother X manuscript is simply misleading. Let me take a simple example with which I am familiar from the work of my former Ph.D.student Jakob Povl Holck, the example of the earliest Danish medicinal books ascribed to one Henrik Harpestreng. Holck shows very convincingly that the idea of one original, authentic medicinal book as the mother X of all the various versions which we have, runs counter to the facts of book production and even more to the idea of knowledge in the late Middle Ages. The Danish medicinal books only make sense as being works which form an integrated part of *a tradition of thought* that both in both form and content stretches back to Galen and probably all the way to Hippocrates and Ancient Egyptian medicine. To separate what is a Danish original and what is taken over from the Germans - who took it over from the Romans - who adapted a Greek tradition, and so on and so forth, simply cannot be done. It is the wrong question, so to speak. The texts are interwoven with translation loans and themselves exhibit a mixture of Latin and Old Danish, a prime example of the stuff that the new philologists use to challenge the old ones: What good would a reconstruction of what text do here? Maybe there was once a cleric called Henrik who sat down with a handful of manuscripts to integrate their stories or rather to order the knowledge that he had in front of him and in his own head, but surely to reconstruct that text is tantamount to reconstructing nothing significant. Rather, what we must do is study what life the texts that we have had handed down to us, have been through. What sea of manuscripts were they part of? fluid and changeable as it was - as well as impermanent, for most of it has long since evaporated out of existence.

5. Architectural reconstruction and its problems, the case of the Alhambra

The new philology argues that it is impossible to reconstruct one single text and that one should rather try to reconstruct the body of texts that this particular text formed part of. In this section, I try to document an equivalent problem in the case of the so-called Muslim fortress and

palaces of the Alhambra in Granada, Andalucia in Spain.

Since there is not so much time left, I shall argue more tightly and since by now I suppose that you are all familiar with the basic logic of reconstruction I shall limit myself to a few remarks.

In 1492 Ferdinand of Aragon and Isabel of Castile completed the *reconquista* of Spain by conquering the Alhambra. Until then, not very many had seen the interior of the palaces at the red hill perched above the town of Granada, and apparently what the catholic monarchs saw, awed them into a rare move. Instead of tearing down the Alhambra, they appointed the count of Tendilla to be the guardian of the palaces and left it virtually untouched. Charles the Fifth, however, duly built his palace right in the middle of the structure, thereby giving evidence of an unheard of show of his much proclaimed love of the Alhambra. If that be love, then beware of lovers! The Charles palace fits the Alhambra as the boxing glove fits an eye.

Be that as it may, the problem of the reconstruction of the Alhambra is no different from that of any other late Middle age fortress, except precisely that here we have more of the structure from when the Alhambra was alive than is usual. This would seem to be an advantage, but it is not so. Rather, it pinpoints the crucial question: What Alhambra of the many possible Alhambras is to be reconstructed as being *the* Alhambra? Obviously, taking away all later additions (notably first the Charles Palace, please), would be quite impossible for when to stop? There seems, furthermore, to be agreement among Alhambra scholars that the later palace additions are what make the Alhambra the jewel of the crown. Obviously, then it would be completely foolish to reconstruct the earlier phases.

Oleg Grabar who is my main authority, states this succintly when he talks about the problem of understanding a building which is so clearly additive (Grabar 1978 (2004):90). The later kings took what was already there and turned it into a building of an even higher complexity.

There is just one complexity which has not been noticed very much although it has been commented upon, and this is the problem of colour.

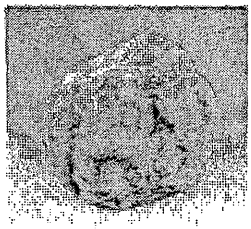
All that we know of the Alhambra tells us about a splendour based upon ornament riches and underlined by a daring and original use of colour. And yet, what meets the eye when the visitor turns up, is virtually - nothing. (fig. 1) With the exception of the tiles, which indeed are a precious chapter by themselves, we may state that what impresses the visitor is completely the opposite: the clarity of structure, the stern adherence to symmetry of even the most intricate patterns, and the absence of any addition of colour to the ceilings and the stuccoed vaults of which there are a multitude, believe me. By now, you will be tired of listening and accordingly, I will show you some pictures of the Alhambra in order to document my point. Here first, we have a window. (fig. 2) Complicated, yes, but not complicated enough, apparently, for in the official guidebook of the Alhambra we read that only one place in the whole structure we find a ceiling which has preserved the original - whatever that may mean now - type of windows, i.e. with coloured stained glass. Imagine what a palace with hundreds of windows would look like with the Andalucian sun pouring in through that type of windows. Undoubtedly, quite another story than we actually get.

Here again is the famous ceiling of the Comares hall. (fig. 3) This is a central hall of the whole complex, and we know that it once looked like this: (fig. 4)

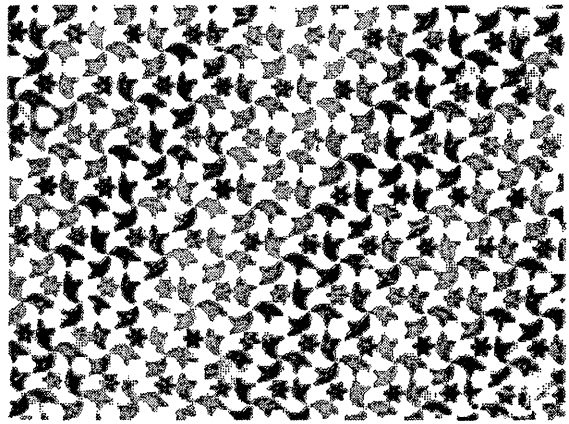
Two final examples. The drawing by P.J.Girault de Prangey from as late as 1837 showing the original colours of one of the porticos of the palace of the Lions (fig. 5) and Owen Jones' reconstruction of one of the alcoves of the Court of the Myrtles. I underline that both of these may be seen only in the guidebook, the actual colour in Granada is gone forever. (fig. 6).

So here we have a new paradox. It is customary to speak of the lack of evidence for reconstruction, but in this case we have the opposite situation. We have abundant evidence that the palace originally was multicoloured and yet the restoration has produced an Alhambra, which, when we except the tiles, is conspicuously monochrome. There may be all kinds of financial matters involved here, and I shall not speculate on the reasons for the decision, just offer some preliminary and brief thoughts on the effect.

Patio de los Arrayanes (zócalo de alicatado)
Tiled wainscot in the Courtyard of the Myrtles



Turquesa / Turquoise



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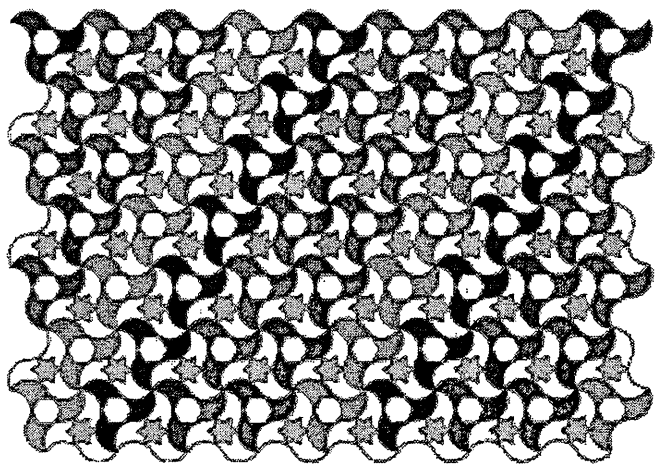

Fig. 1. Source: Purificación Fenoll Hach-Ali e Alberto López Galindo: simetria en la Alhambra, Universidad de Granada, 2003.

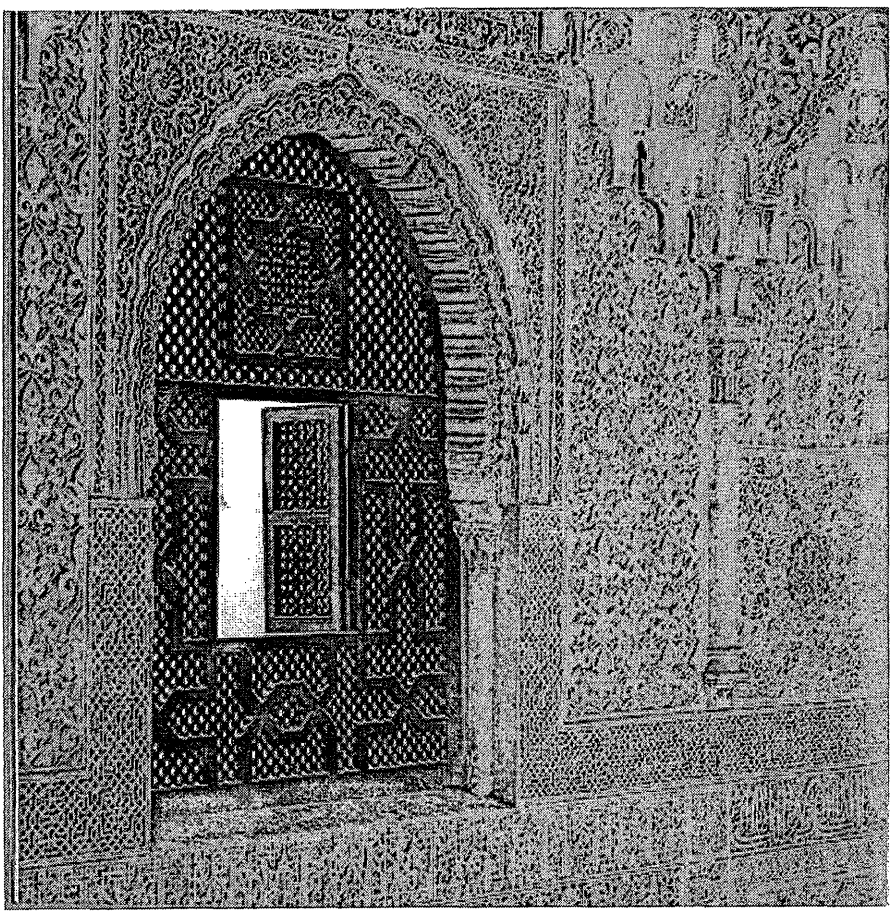

Fig. 2. Source : Lluis Casals : The Alahambra of Granada and Felix Bayón, 2000.

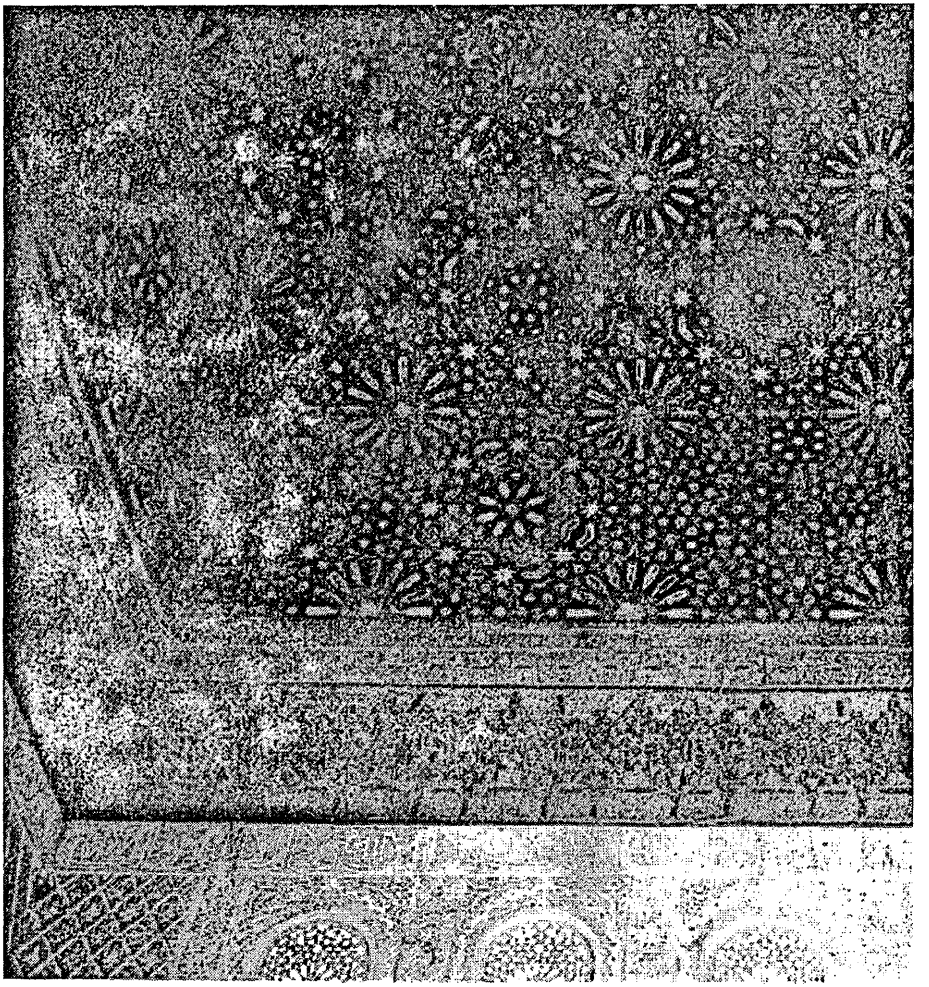

Fig. 3. Source: Grabar (see references).

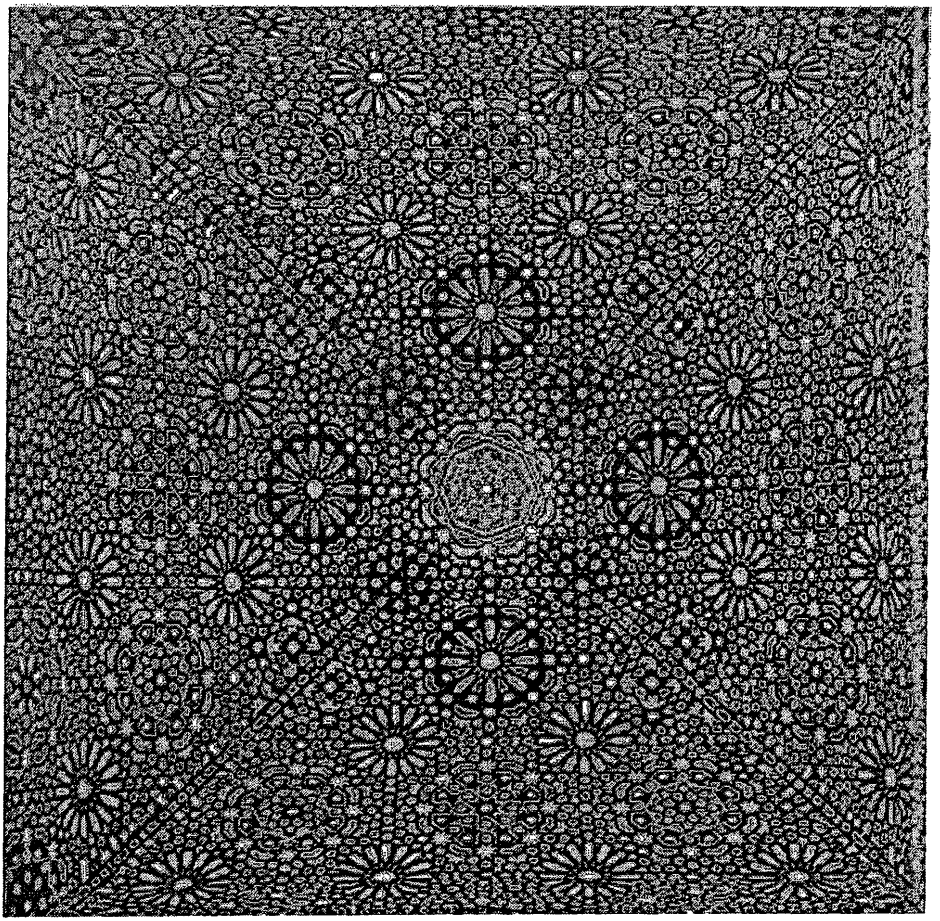

Fig. 4. Source: Official Guide. The Alhambra and Generalife.

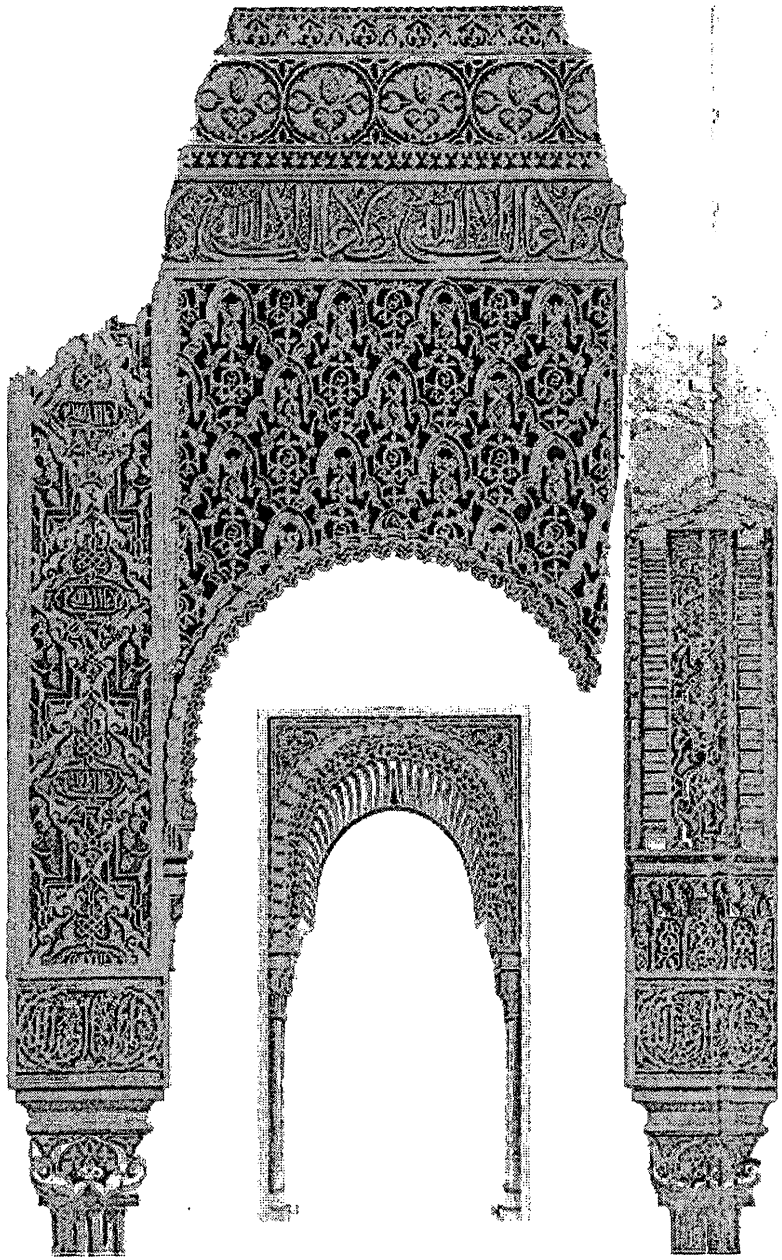

Fig. 5. Source as fig. 4.

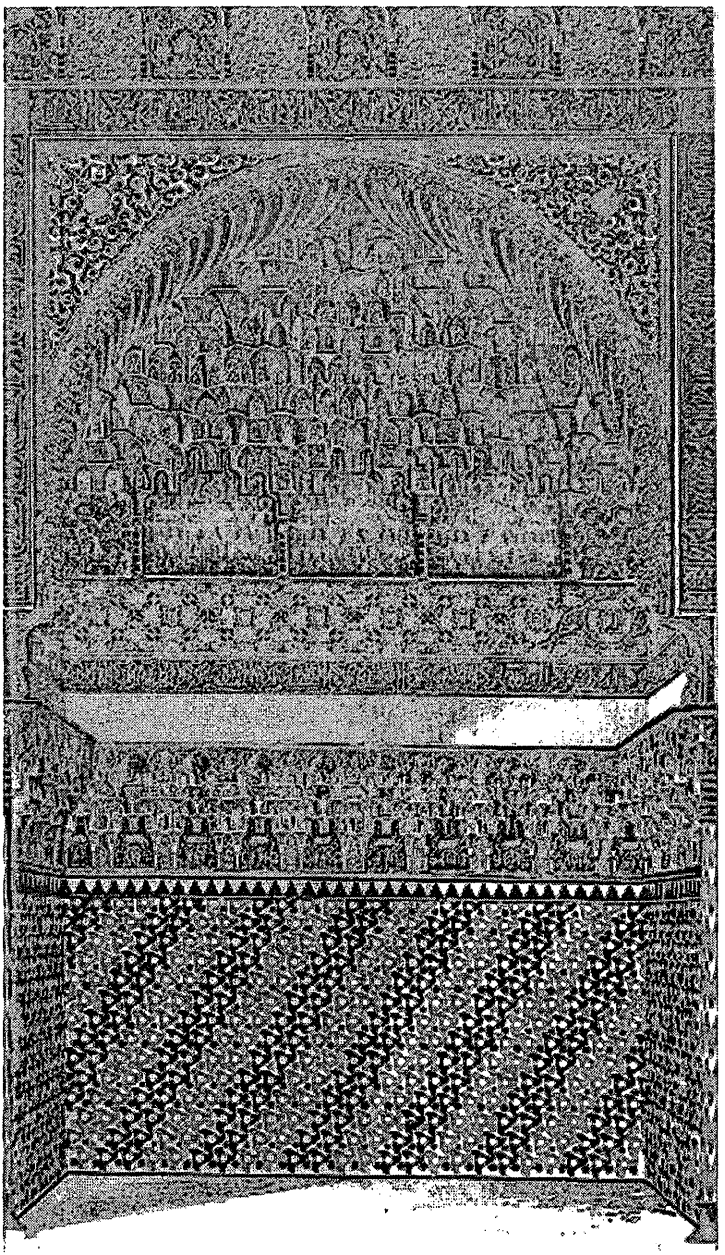

Fig. 6. Source as figs. 4 and 5.

Obviously, the lack of colour gives us an Alhambra which is much more structural and much more focussed on architectural details than on the ornament. It is as if the restorators have striven for a noble, purified work of art, devoid of too much of the orientalism that is so hated from both sides. The result is a sort of structuralist version of architecture which has been very influential and very successful as a kind of forerunner of the international style of modernism. The ornament is there, the elegance is unsurpassed, but it is white and thus fits perfectly as second in rank to structure.

6. Once more on the problem of colour, the case of classical painted figures

In the previous chapter, we concluded that whatever the reasons for *not* reconstructing the Alhambra as we know it, must have been, the consequences were that structure defeated ornament and that colour as an ornament was subdued. In this section on the classical sculptures, we shall look a bit closer at the problem of colour.

The history of the problem of colour in antiquity is strange. As pointed out by Stubbe Østergaard 2004 (cf. Stubbe Østergaard 2004a and 2004b as well as Bukdahl 2004 who all of them agree to point to Winckelmann as the founding father and best defender of the faith in the whiteness of classical sculpture), the controversy of whether or not the antique sculpture was coloured was settled conclusively by 1863. In that year, the so-called panser statue of Augustus was excavated in Prima Porta very close to where the empress Livia's villa was once situated. And the statue was so well preserved that noone could miss the traces of paint on its surface. Twenty years later, a reconstruction of what the statue must have looked like, appeared in a German work on *Dorische Polychromie* - and the whole matter was forgotten. True, noone forgot to mention that 'by the way, classical sculpture had been painted as well' but the pictures and the descriptions continued as if nothing had happened.

Clearly, we are facing a blockage to reconstruction even more serious than in the case of the Alhambra, if it is not in a deeper sense the

same[4].

In 2004, the Danish museum of the Glyptotek, the Vatican in Rome and the Antikensammlung in München joined forces in putting on a show called ClassiColor. The show featured numerous examples of reconstructed classical sculpture in polychrome versions. I will show you two examples of Roman sculpture, as it is now and as it presumably was, and conclude by commenting briefly on the pictures.

First, we have here the panser statue of Augustus from Prima Porta. It looks like this when it is on show at the Vatican Museum in Rome. (fig. 7)

And like this when the reconstruction has been carried to its logical conclusion. (fig. 8)

Next example is the head of Caligula from the Copenhagen Glyptotek. It looks like this and if you look carefully enough at the original you may still see remnants of brushstrokes at the ears. (fig. 9) These and other traces have been put to full use in this reconstruction: (fig. 10)

I am sure some, if not all, of you would hate to have all the classical sculptures treated like this. I am sure I would. But it is rather interesting to speculate on why[5]. One obvious reason is that the reconstructions look more like Jeff Koons or other pop artists making fun of the tourist industry. But why, again? Because they are realistic, and classical sculpture by now - and now in this case means since

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[4] It has come to my attention that there may be a connection between the two that I had overlooked: The work on colour in the Alhambra was done originally by the architect Owen Jones in his *Plans, Elevations, Sections and Details from the Alhambra* which I have not seen (London:1842-45). Apparently, the same (?) Owen Jones was active in the debate on classical color (Stubbe Østergaard 2004a: 32).

[5] A fact almost too obvious to mention, is that the colour paint in the case of the reconstructions was put on by restorators, not artists. In the classical world, it seems, they had artists who specialized in working with particular sculptors and were regarded as indispensable for the artistic result

Fig. 7. Source: Classi Color (see references), Musei Vaticani Citta del Vaticano.

Fig. 8. Same source as fig. 7.

Fig. 9. Same source as figs. 7 and 8.

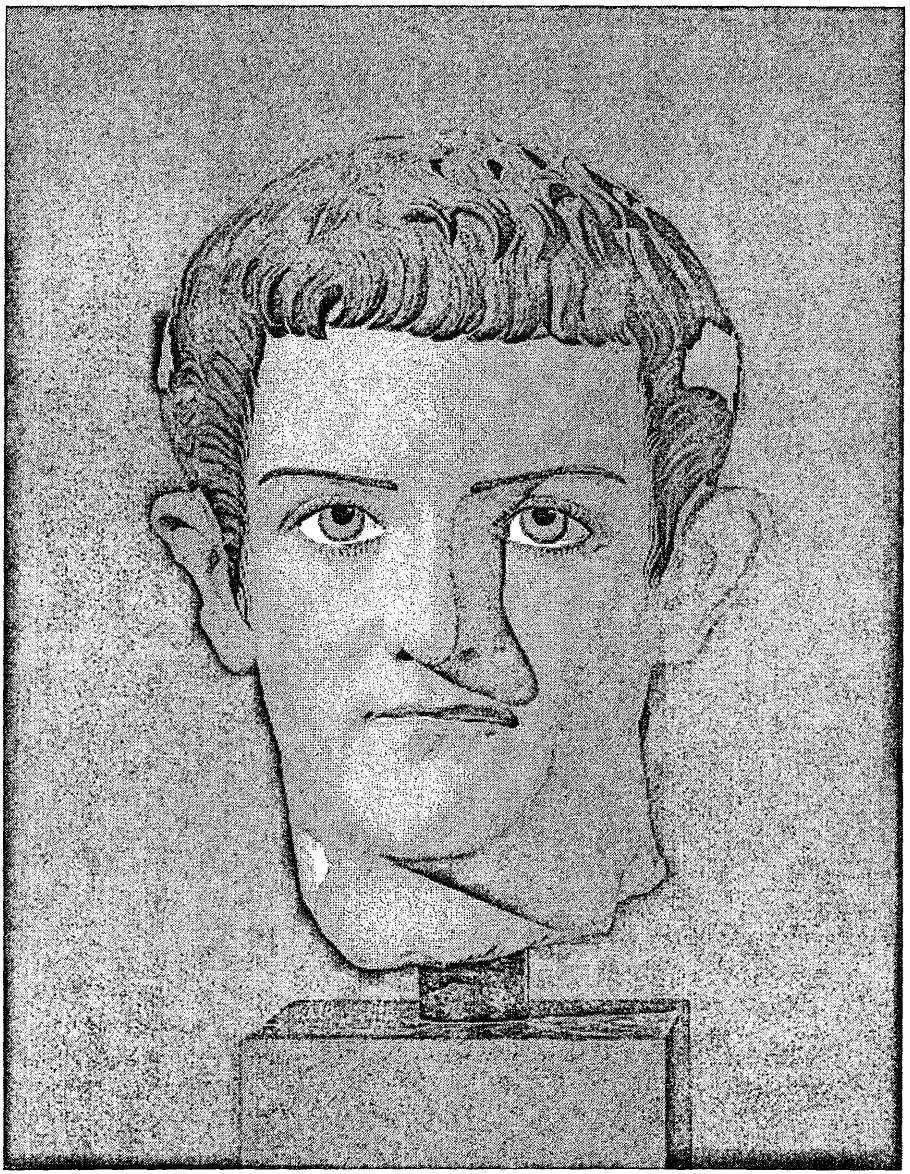

Fig. 10. Reconstructed portrait of Caligula. Same source as figs. 7 and 8.

Winckelmann and Herder (Stubbe Østergaard 2004: 9ff) - is assumed to be quite the opposite. It is the ideal representation of idealism - as far from any reality as any platonic idea would be. The bust seems to sum up the essence of man precisely because it cannot be mistaken for a representation of the particular person that it happens to portray. The classical busts simply do not portray in any modern sense, at least they do not do so - now.

In a more profound sense this may be a version of the perennial fight against realism in aesthetics but that will, I am certain, take us too far afield.

Conclusion: The enigma of historicity

I have attempted to show that reconstruction is only possible under some version of historicism. But historicism cuts both ways - when it is accepted. It is not only a matter of time and the ordering of events. And it is certainly not only a matter of finding the authentic version of the object, perception cannot be exempted from historicity. On the contrary, perception is also historical as I have argued in the final chapters. And we cannot reconstruct the original perception as we can reconstruct the object perceived.

We may reconstruct - and then in some cases we may not. Whether we do it or not, we cannot hope to turn back the irreversible passing of time. In a fundamental sense, we cannot go back, and all reconstruction is a projection of the present into the past. Even if we play the Mozart sonatas on instruments stemming from Mozart's own time, even if we go by contemporary accounts of how he played his own music (How fast and how loud was he? And how in the absence of any gold standard for tempo and intensity would we know how to interpret the comments?) we cannot alter the fact that a CD of the event can be turned on so frequently that we can hear the sonatas infinitely many more times than Mozart himself - let alone anyone else in his time - ever did. Classical music has become a commodity in every version of the word. The reconstructed items are of the present and thus merely reconstruct the present's view of the past, not the past itself. That is irretrievably lost.

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