The 'Millennium Programme':
Looking back, looking forward

Halina Dunin-Woyseth

The editors of *Nordic Architectural Research* (*Nordisk Arkitekturforskning*) would like to present the research education programme, called the Millennium Programme, to a broader Scandinavian audience. This presentation should describe the background, the contents, the teaching process itself and, finally, the evaluation of this academic undertaking, as well as its potential future consequences.

In order to grasp it all in an amenable format, three documents, which played the role of milestones for the launch and completion of the Millennium Programme, will be used. These three documents are the original application texts, (i) one for the introduction of the programme, also comprising brief descriptions of the four national research courses, and the other, (ii) an application for the funds to arrange a meeting for the Network in order to evaluate the executed programme and develop principles for future co-operation in Scandinavian research education; and, finally, (iii) a report from the NAAS (Nordic Academy for Advanced Study/Nordisk Forskerutdanningsakademi, NorFA) meeting.

The sponsor for the Millennium Programme has been the NAAS. In order to gain their economic support, the applicants are supposed to introduce the idea of the academic event in question and argue for its scholarly value. Results from an anonymous peer-review decide whether resources will be allocated in support of the academic initiative applied for. Each of the four national research courses has been given such support. The Millennium Network has been granted support for the evaluation of the Programme and as an encouragement to continue their co-operation. The original NAAS application texts have never before been published. The introductory application has been formulated by this author, as well as the application for the meeting grant and the report from the NAAS meeting. The primary descriptions of the national courses, following the main application, were written by the national members of the Network. Yet all the texts have been discussed and commented by all the members. The first application texts were written in English, and they are being verbatim quoted below. Those drawn up after the completion of the Programme were originally in Norwegian and, later on, translated by the author into English.

This approach, based on the use of the original application and report texts as the base for this contribution, has both advantages and disadvantages. In using the NAAS texts one

can experience some degree of time authenticity, as the process of the preparations started in early 1998 and the concluding report was sent to the sponsor in March 2002. This can be regarded as an advantage. On the other hand, the application texts comprise some repetitive parts which were difficult to avoid, as they were written within a longer time frame and were necessary for the argumentation of the individual document. That can be considered a disadvantage. The texts quoted will tell their own stories, while comments will be supplied in order to provide a touch of "presentness" to the whole.

Application for the Programme, March 1999

'Millennium programme'. Research education for design professionals: Towards an identity of design/'making' knowledge

In March the Oslo School of Architecture applied on behalf of the Network for the launching of the Millennium Programme and was granted support for the first Norwegian course. The following was written in the application:

"This application concerns a Nordic programme of research education for professionals in the fields of design, architecture and spatial planning. The subject matters of these fields create a remarkable variety and volume of artefacts and man-made environments surrounding us in our daily lives. These fields of expertise will henceforth be referred to as design/'making' professions.

There is evidence of specific design thinking related to design practice. In this context, it is worth examining whether organised design knowledge is possible, what it may be, and how it may be systematically developed through research in an advanced academic manner. Design scholars maintain that because of the new conditions and problems meeting professional designers and society at large, there is a need for developing such design knowledge, and that the way to do so should first and foremost be through doctoral education and advanced research. While the 'making' professions represent diverse fields of expertise, design scholars maintain that it is possible and desirable to seek a discursive unity of all design /'making' -related knowledge as a common field of inquiry.

The character of the doctoral studies for 'making' professionals is rather similar in the Nordic countries. The historical evolution of doctoral programmes reflects changes in the epistemological status of design knowledge, specifically with respect to the relationship between theory and practice. It is possible to discern three stages in this evolution. During the 'initial phase' (until the middle of the 1970s), PhD students carried out their research in the framework of an individual arrangement with their supervisors, most of whom were not scholars, but highly esteemed practitioners.

In the 'second phase' (the middle of the 1970s – the beginning of the 1990s), a scholarly status was sought by academic design bodies to provide design knowledge in a more conscious and institutionalised way, in an effort to become more academically oriented. Some theoretical disciplines, especially the social sciences, became models to follow. Design practice was regarded as a sort of 'applied science'. As a consequence of this, PhD students were expected to 'renounce' their professional backgrounds as designers, architects or spatial planners. While doing so, they were told to cease dealing with the particular, and instead enter the world of science, dealing with general problems and statements which have scientific validity. In order to comply with these expectations, they had to plunge into the theory, epistemology and methodology of the social sciences, which formed the basis for their new professional area. As a result, research projects in architecture, design and spatial planning were at best bleak imitations of social science research. That model of doctoral studies never answered these important questions: What is unique about design knowledge? Does the concept of design knowledge as an 'applied science' allow for adequate theoretical and epistemological foundations for design thinking? Do such questions also concern other professional disciplines? A discussion about the desirability of a more pronounced epistemological status started at some Scandinavian Schools of Architecture.

In March 1992 the Aarhus School of Architecture, supported by the NAAS, held a seminar in order to initiate a Nordic network of co-operation on research education for 'making' professionals. The participants represented some Scandinavian Schools of Architecture offering professional training within design, architecture and spatial planning, i.e. the design/'making' professions. At the time of the seminar these Schools were in the process of establishing their doctoral programmes based on obligatory research education. There was a strong need to discuss issues at a broader level than national contexts, possible contents, and modi of research education in the fields of 'making' knowledge. The

An Aarhus break. Photo Ingunn Gjørava.

network has co-operated since then, and with generous sponsoring by NAAS, it has organised a series of Nordic research education courses (Oslo/1992 and 1993, Bergen/1993, Århus/1994, Sigtuna/1994, Karlskrona/1995, Helsinki/1996). These courses contributed to the 'third phase' of the evolution of doctoral studies where the focus has been put on establishing the identity of design thinking. The 'third phase' has witnessed some attempts to answer questions like these: Is it possible to find unity in the diversity of our approaches to design and design research? How do artefacts come into being? What are these artefacts and what are their properties? What are the outcomes of artefacts in the individual and collective lives of human beings?

In the history of professional design practice, many answers have been given to these questions. These answers created a body of design knowledge which most often has been tacit, personal and private. Through doctoral education, this knowledge has been systematically sought to become more explicit, general and public. The way to do this leads in three directions, and each of these is acknowledged by scholars in other fields of inquiry who recognise their common historical academic roots. One of these categories is design history, which is concerned with the gathering and interpretation of design evidence, as seen in past practice, through external influences and its own effects.

The second of these three categories (in no particular order of importance) is critical analysis, or design criticism, aimed towards assessment and appreciation of artefacts as they exist in our daily lives. This research direction still does not have a strong position, but its relevance and importance lie in the provision of a body of information and professional discussion, which together concern both design practice and design theory.

The emergence of yet another way of research can be noted, namely that which combines empirical and speculative inquiry. It is directed towards the formation of theories that may be crucial for future practice. Moreover, it aims for a more general understanding of design and 'making' in cultural and social contexts. This research category often leans on the concepts and methods of other fields of inquiry, but with a conscious focus on design-inherent purposes. There is a growing confidence in the international community of design, that design knowledge is a vehicle towards integrating knowledge from many sciences, without the need to become experts in one or all of the sciences from which knowledge has been "borrowed" in order to pursue design/'making' processes. Some radical scholars (for instance Schön and Glanville) maintain that scientific research is carried out according to similar intellectual patterns as that of design, and that research is just another example of design thinking.

The members of the Scandinavian network are more convinced than ever that research education should be offered to the Nordic community of PhD students recruited from the 'making' professions. Through dialogues within our Scandinavian network a concept of a research education programme has been formulated. Four national centres agreed to share the responsibility for each of their contributions, and it was decided that the programme should be carried out in a compact way, i.e. within one academic year (1999 / 2000) – hence the name of the programme, the Millennium Programme. The 'making' knowledge is to be introduced to and discussed with the participating PhD students in a 'concept of three modes'

i) a "bird's eye view" of the landscape of knowledge fields. This mode will offer them the possibility to 'position' the professional disciplines and 'making' knowledge within the contexts of their own projects;
(ii) in-depth studies in the realms of 'making' knowledge, structured through three scales (that of objects, of buildings and of urban space), and finally
(iii) through a unifying milieu perspective at the field of 'making' knowledge.

A common pedagogical concept will be adopted for the four courses. Recommended Reading lists will be announced together with a common written assignment approximately 8 weeks prior to each course. Lectures with related seminars will be given during the national gatherings, each of approximately one week's duration. During these gatherings a series of colloquia will be carried out, during which assignments will be orally presented by the PhD students and discussed as well as evaluated by the staff. The responsibility for sharing the national courses will be as follows:

- The Norwegian Course (No. 1) will start the Programme in September 1999 (Introduction to the Programme and The Scale of Objects). The Norwegian team will consist of the staff of the Oslo School of Architecture and the Faculty of Architecture, Spatial Planning and Art of the Norwegian University of Science and Technology in Trondheim;
- The Swedish Course (No 2) will continue the Programme in December 1999 (The Scale of Buildings). The Swedish team is affiliated with the Faculty of Architecture at the Royal Institute of Technology in Stockholm;
- The Danish Course (No. 3) will commence in May 2000 (The Scale of Urban Space). It is anchored at the Aarhus School of Architecture;
- The Finnish Course (No. 4) will close the Programme in August 2000 (A Unifying Milieu Perspective at the 'Making' Knowledge and Some Conclusions) as well as make an attempt to tentatively assess the whole Programme. The responsible institutions for this part will be the School of Architecture and the School of Arts and Design, both in Helsinki.

International guest lecturers will be invited to each of the national courses. The Millennium Programme will be concluded through a common publication which will be recommended for research education for new batches of doctoral students in Nordic countries and elsewhere."

The following was written about the goal and content of the national courses :

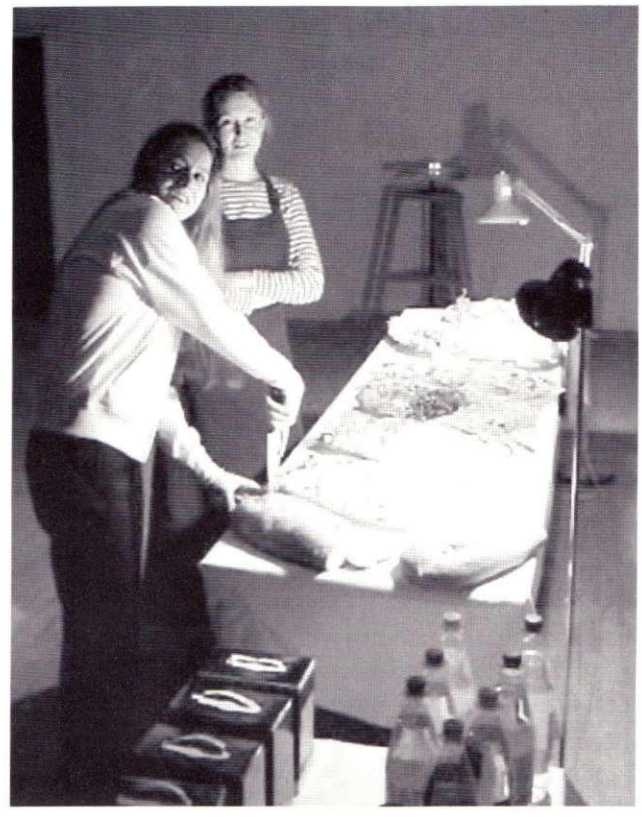
"The goal of the Norwegian course is (i) to contribute to a deeper understanding of science, and of one's own position as doctoral students carrying out research in professional and design / 'making' – related subjects; (ii) to get acquainted with the knowledge base of these subjects as conceptualised by the History, Theory and Criticism of design. The science-related part will take into account the fact that the Programme participants are recruited from design professions (designers, architects, and spatial planners) rather than from established academic disciplines, so that their familiarity with academia in general is either limited or missing. A series of lectures, collateral readings, and the PhD-students' own assignments will be aimed at redressing this situation by providing a general introduction into science and research in their many aspects. It is expected that this science-related part of the course will be instrumental in establishing or reinforcing foundations of an academic identity for the participants. It will be crucial for the doctoral students to position their own research projects in the context of existing knowledge taxonomies. The concluding part of the course aims at further strengthening the academic identity of the participants through a series of lectures and seminars dedicated to the three main streams of design/'making' knowledge represented by design history, design theory and design criticism".

The Swedish course was introduced as follows:

"In the Swedish course the studio will deal with issues of methodology and research project design that are specific for action- oriented disciplines like architectural research and other 'making sciences' (business administration, engineering design and systems design). A special emphasis is put on writing as a knowledge producing activity, and on the constitution of concepts as a tool for both practical and scientific knowledge. Models, metaphors, scale and cross-disciplinary communication are the key issues to be discussed in the course. A case study methodology for action – oriented research is proposed. Individual tutorials will be of importance as well as a set of lectures and seminars concerning issues that are central for the studio. The studio lasts one week (6 days , and half a day for the evaluation of the studio and preparation for the next one). The studio thus comprises three weeks of work for the participants, two weeks of individual preparations and one intensive week during the autumn semester of 1999. This intensive week comprises one day of introductory lectures, a three day workshop (see below), and two days of lectures and seminars on subjects related to the theme of the course and the course literature. The course addresses questions like the role of models, artefacts, scales, metaphors and analogies in design practice and design research. Metaphors, analogies, and models are treated as performances of thought. A model is thus understood not simply as a series of signs organised in relation to certain rules, but also as being separable from an event, or performance, which takes place over time and involves people who discuss and remodel events. A workshop will be held for the examination of the papers prepared in advance by the course participants. A programme will be sent to the participants eight weeks before the course begins".

The goals and the contents of the Danish course were described in the following way:

"The city is perhaps the most complex of artefacts. The making of cities includes a multiplicity of actors; as a highly complex artefact the city is incomprehensible from any single point of view, and the use of cities is differentiated among classes, groups and individuals. The knowledge of cities is differentiated among a multiplicity of disciplines, some of which are academic/theoretical, others are practical/professional. Just like architecture, the city easily lends itself to



Party, KTH. Photo: Ståle Stenslie.

investigations from both the humanities, the technical-scientific disciplines and the social sciences. From a professional point of view the city is an object of the practically – oriented knowledge of urban planners, architects, technical experts, policy experts, management experts, economic consultants and social workers.

'What are the typical characteristics of the various forms of knowledge of the city, how do they relate to each other and to the activities of city-making?' With the point of departure in this question the course will have a triple focus: a) the urban scale, b) questions of disciplines and interdisciplinarity and c) relations between forms of knowledge and forms of action. The goal of the course is to present and discuss the various ways the city is constituted as an object of theoretical and practical knowledge, the possible modes of overlap and conflict between them and the consequences for the interaction of actors in the making of cities.

The course will be offered 8–13 May and it will be composed of three parts: 1) introductory lectures by the course teachers 2) workshops with invited professionals looking from their points of view at some 'making' cases of the city of Aarhus, 3) presentation and critique of participants' papers".

The Finnish course was introduced as follows:

"This is the last course of the Millennium Programme, and in spite of having its own theme, it also will try to sum up the results of the three previous courses. At this point we expect to have clarified the specific methodological problems and the processes of research which concern architectural and design studies. The aim is to develop architectural and design research as an independent field of knowledge. The cases of action-oriented research will be introduced (the theoretical part combined with product development or artistic presentation, etc.). Individual tutoring for the upcoming doctors will be the central part of this workshop-based seminar. The course will build upon a three week work load for the participants, of which two weeks will be devoted to literature studies, and to preparing individual presentations. An intensive week will be used for the course itself during the last part of August 2000. The first day of the course will include the keynote lecture by the philosopher Georg Henrik von Wright. The course will lay emphasis on discussion and criticism of the individual PhD proposals. The last day of the seminar will be devoted to summing up the Millennium Programme".

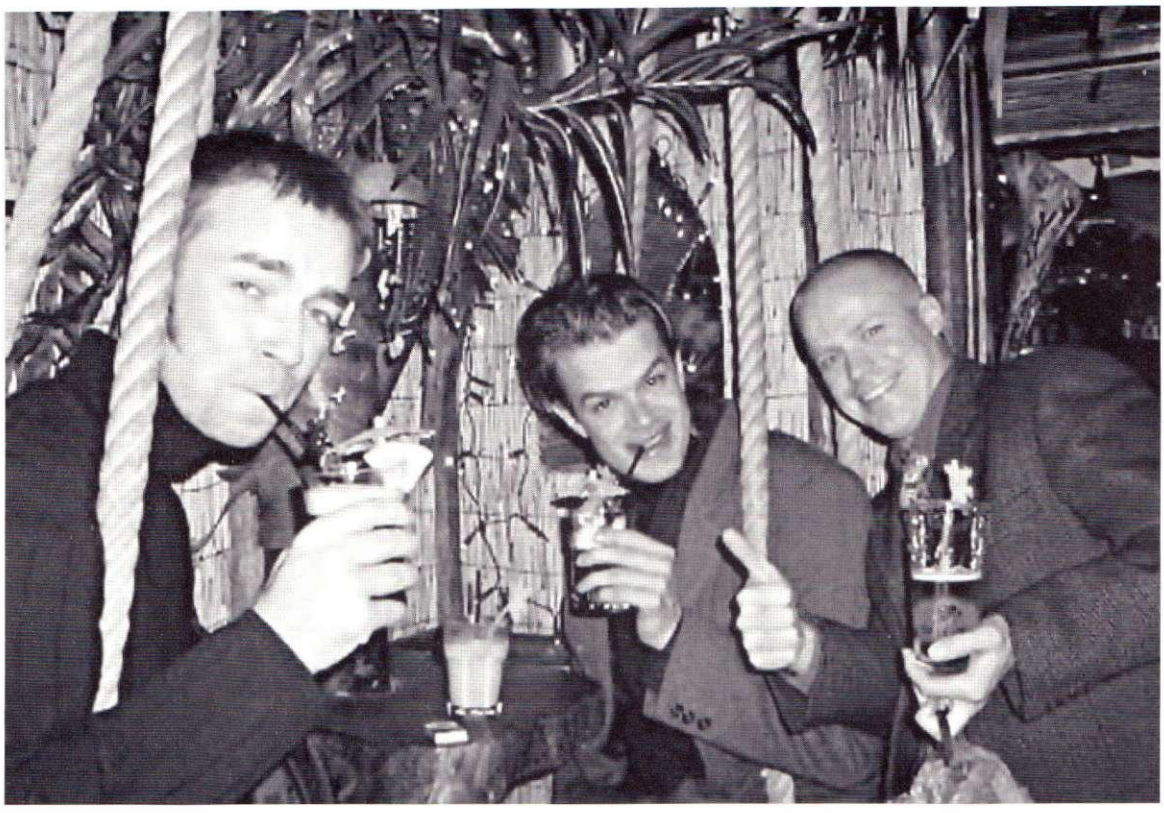
The Finnish course closed the Millennium Programme on the 26th of January 2001. It was executed according to the initial conceptions and plans. The changes in the timetable were caused by the illness of one of the Network members. Thus, instead of in August 2000 the Programme closed in January 2001. It gathered approximately 50 PhD students from the four member countries during the whole period. A strong core of participants committed themselves to follow all four courses.

Application for Planning Meeting /Feasibility Study, August 2001

In spite of a very brief and general "user–feedback", which was formulated by the participants on the last day of the Helsinki course (cfr. Evaluation text of 26 January 2001), the Network recognised the need for a more in-depth discussion on what has been done and if and how to go forward with further Network co-operation. In order to proceed with this, the Millennium Network applied to the NAAS for funds for a so called "planning meeting/feasibility study" in August 2001. The meeting was to be held at the Oslo School of Architecture at the end of 2001. The application text followed the guidelines of the sponsor, whose representatives expected answers as to the targets and aims, organisation and relevance of the planned academic event for the Nordic region. The excerpts of the text below suggest some tentative appraisal of the Programme as a point of departure for the continuation of their work in the future:

"Since the completion of the Programme, many reflections and ideas have evolved. The Programme seems to have supported the process of development of a disciplinary identity for the design professions. The questions of the subject matters, research methods and theoretical frameworks have become better formulated and partly answered. The planned publication with the title "Towards a Disciplinary Identity of the *Making* Professions" (1) has been useful in this process. Because the Programme has proceeded over a relatively long period of time, there were numerous opportunities to practice and test the PhD students' abilities of critical thinking, as well as to discuss the quality standards of research work in general, and of design-related research especially. As each Nordic country has a variety of research themes, very few people are actually dedicated to each theme. The Programme managed to create a fertile soil for networking among those interested in similar subjects. These pooled resources can now constitute a viable critical mass for most of these groups at a Scandinavian level.

In one of his recent publications a Swedish scholar, Ulf Sandström, mapped two parallel and at the same time opposite tendencies in Government-funded, or "sector" research where architecture and design also belong. One of the tendencies in profession-related research, according to Sandström, moves towards the "academisation" of knowledge in the direction of what is usually called monodisciplinarity. The other one is oriented towards solving problems derived from everyday life situations. (2) This kind of research joins the development in knowledge production which recent literature often calls transdisciplinary. In the seminal publication "The New Mode of Knowledge Production" (4) a group of international knowledge theoreticians described some basic changes going on in knowledge production processes. They called the traditional, academic, identity-consti-



Party, KTH. Photo: Ståle Stenslie.

tuting monodisciplinary, knowledge production Mode 1, while they announced a massive development in knowledge production, termed Mode 2. While the former is most often of monodisciplinary nature, the latter is transdisciplinary. It is described as follows:

> Transdisciplinarity is a new form of learning and problem solving involving co-operation among different parts of society and academia in order to meet the complex challenges of society. Transdisciplinary research starts from tangible, real-world problems. Solutions are devised in collaboration with multiple stakeholders. A practice-oriented approach, transdisciplinarity is not confined to a closed circle of scientific experts, professional journals and academic departments where knowledge is produced. Through mutual learning, the knowledge of all participants is enhanced, including local knowledge, scientific knowledge, and the knowledges of concerned industries, businesses, and non-governmental organisations (NGO's) (3).

Transdisciplinarity, understood as Mode 2 of knowledge production, will, according to the leading knowledge theoreticians play an increasingly important role in both the academia- and vocation-related fields of knowledge, owing to its contribution to society at large, to the business community and to the local environment as well. The profession-related fields, of which design professions make up a significant part, are still widely perceived as not yet being up to the task of an equal partner. There is thus a strong need to train a new generation of researchers in these fields to gain competence which would be adequate to join other contributors in the problem-solution-oriented research. Research education, which has as its objective the strengthening of the disciplinary identity of doctoral students, aims to prepare them to observe the academic quality standards in their work and to train them in critical thinking. This is associated with the traditional Mode 1. However, obtaining the research competence necessary for problem-solution-related research, i.e. Mode 2, will be in strong demand in

the profession-related fields, among others the design professions, as much of the literature on the subject argues.

The Millennium Network intends to co-operate in order to launch a common research education offer to Scandinavian PhD students with design-professional backgrounds. This programme will address the two "modes" of knowledge production. The experience derived from the Millennium Programme will be decisive for the formulation of the Mode 1-related courses. A concept for Mode 2-related courses will be debated and tentatively defined. Further on, the relationship between theses two types of courses will be made more accurate, and principles for sharing teaching duties will be agreed".

Report from the Planning Meeting of the Quadrologue Network, March 2002

The meeting of the Network was held on 6–7 December 2001. A report of 14 March 2002 was sent to the NAAS. The meeting seems to have been an important milestone in the Network's 10 year long co-operation in research education. Almost the whole text of this report is being quoted below:

"On the evening of 6 December 2001 the discussion concerned the evaluation of each of the four courses, as they were experienced by the national groups of the PhD students and later on reported to the own national members of the Millennium Network. This detailed evaluation closed, the central point of the discussion was moved to an examination of what was achieved by the Programme in toto and as seen from a time perspective of the 10 years, i.e. the period the Network has existed.

The Oslo Course
The course was of an introductory, general character. It was strongly knowledge-oriented. It functioned well for those PhD students who were in the starting phase of his/her doctoral studies (the Norwegian group), but was less relevant for those who were more advanced in their studies (the Finnish group). The course was content-intensive and difficult to follow for those who waived "required reading" prior to the course. Individual written criticisms of the assignments, prepared prior to the course, were considered a good pedagogical component of the course. There was a want for some "breathing holes" in the course programme, in order to enable some extracurricular activities during the course period. Living dispersed in the city was not regarded as a milieu-building solution.

The Stockholm Course
The lectures, especially those offered by the local staff, were regarded as highly relevant and pedagogically well introduced. A British contribution from a non-design-related academic milieu was considered less pertinent, probably because only a few participants read his publication prior to the course. The seminar assignments could have been less open, which could have facilitated a better focus during the seminar discussions. The social aspect was well addressed. The accommodation being in one place and in a central location of the city was well appreciated.

The Aarhus Course
The Danish course was deemed to be academically the strongest. One of the reasons for this success could have been that it was based on one major concept which allowed for an in-depth handling of the subject matter. The Danish teaching team was particularly highly praised. Two case studies made up the local reference for the course. That was regarded as less appropriate than what could have been gained by using only one case. The seminars, based on ad-hoc writing of short texts and on immediate responses from the teachers, functioned well. Living in one place and within walking distance of the School was considered as milieu-supportive.

The Helsinki Course
This course was most heavily based on seminars as a teaching mode. Because of the bad weather conditions, the main contributor, the philosopher Henrik von Wright, was obstructed from giving his lecture which was highly regretted by the participants. The course was strongly embedded in the Finnish architectural culture, which has given it a special flavour. The seminars were offered, among other places, at Aalto's earlier atelier in Helsinki and at Saarinen's Hvitträsk, which is one of Finland's famous monuments of National Romanticism. The accommodation conditions were deemed good.

Summa summarum, in spite of some shortcomings, the Millennium Programme was declared a successful academic initiative by the Network (cfr. The PhD students' critique, delivered on the last day of the Helsinki course, 26 January 2001).

What have we learned with regard to the practical nature of the execution?

- That an appropriate, careful recruitment of the prospective course participants is of great importance (the students should be in the same stage of their doctoral studies);
- The demand for reading the required texts prior to the courses should be purposefully executed, probably through the writing of assignments to be submitted before the course starts;
- It is academically rewarding to give written and/or oral responses to the assignments during the course;
- Some "time pockets" for extracurricular activities should be offered as part of the course programme;
- It is engaging and stimulating to organise "brief assignments" during the course, possibly in groups;
- It is milieu-supportive to organise accommodation in one place for all participants.

From the discussion of the individual courses during the first day of the Planning Meeting, the discussion of the second day moved to a more general level of what was gained through the Millenium Programme. In order to do so, it was necessary to adopt a broader time perspective of 10 years on the research education for architects and designers in Scandinavia and to position the results of the Millenium Programme within these developments *.

The first NAAS-sponsored Planning Meeting was held in Aarhus. This moment was of strategic importance because it coincided in time with a number of structural changes in the Scandinavian universities and university colleges. An organised obligatory research education for doctoral students was introduced for the first time in Norway that year. Moreover, Denmark and Finland started their first attempts to develop organised research education. There was a strong tradition of such education in Sweden, but at that moment it was confronted with the new developments in other Scandinavian countries and thus open for changes. The challenge of the schools of architecture and design which had the right to confer a doctoral degree, was to define what kind of research education the so-called practical-aesthetic fields should entail, those being fields without a research tradition in Scandinavia. What have we learned about the status of research education in Scandinavia today? During the 17 months of the Programme's duration, the Network participants learned, through continuous contact with the approximately 30 PhD students, that over time there has evolved some professional academic know-how as well as formal organisational structures at the majority of the schools of architecture and design. These schools seem to share common objectives as to research education and even as to the basic components of such an education. The latter appear to be:

- Introduction of design practitioners to design research practice through frequent scholarly assignments
- Training in critical thinking with regard to academic quality standards
- Introduction of a broad, diversified knowledge landscape and training in the positioning of one's own research contribution within it
- Building knowledge around the intellectual traditions of design professions
- Increasing the "critical mass" of design researchers involved in current debates on research in particular fields as well as in the broader context of knowledge production

Looking at the study plans of some of the Scandinavian doctoral schools (like for instance those in Aarhus or in Oslo), it is not difficult to "read" their attempt to reach the twain objective of their research education: on the one hand to secure field-specific relevance of their curriculum and, on the other hand, to meet the demands for an inter-subjective platform of academic quality standards which make doctoral programmes in different fields comparable. The Network agreed that the present status of the research education promises adequate training opportunities for the growing Scandinavian community of architectural and design researchers. Even so, this preparedness seems only to apply to the traditional, disciplinary and interdisciplinary academically initiated research".

As to the avenues for the future Nordic co-operation, a longer argument was made in the text, which was partly a repetition of the reasoning used in the NAAS application of August 2001.

"The Network agreed that the next phase of this co-operation should be committed to the preparation of young researchers to meet the demands for a new type of a broader research competence, this being connected with the needs

* The author is aware that this paragraph contains certain repetitions of what was said in the Application text of March 1999, but finds it important to render it in order to maintain the logic of the discussion during the evaluation meeting.

for problem-solutions-oriented research. Some concepts for and good research practice within transdisciplinary research should be the target for future co-operation. As there seems not to be any convincing models of such education elsewhere to emulate, the Network intends to start the process of formulating a curriculum for a transdisciplinary course through a pilot course. This course is called the "Quadrologue Project", as there are four Nordic countries in this co-operation conducting a continuous dialogue between all the parties (dialogue / "quadrologue"). Thus, the Millennium Network has been renamed the Quadrologue Network. We find it worth recommending that the courses be offered to advanced PhD students in their final period of research education, when they have already acquired a certain confidence with regard to Mode 1- related research".

The report closes with a tentative summary of the brainstorming around the content of the pilot course, strongly based on the experiences derived from the Millennium Programme

- The PhD students should start their preparations approximately two months prior to the course. Reading required texts and writing an assignment to be submitted before the course starts will be the entrance conditions to the participation
- PhD students will describe and discuss a report from an executed transdisciplinary project in pairs. A paper of approximately 1500–1800 words will be submitted a week before the course starts
- The course commences with a seminar where the assignments will be presented and discussed (a "learning-by-doing" course component, Day 1)
- An invited philosopher of science gives lectures and chairs seminars on mono-, inter- and transdisciplinarity, based on the prior studies of required reading (an epistemological course component, Day 2)
- Lectures on network models, partner models etc, in Scandinavia (a social science course component, Day 3, 1/2 day)
- A brief presentation of some Nordic examples of transdisciplinary knowledge development oriented towards problem-solving (a "learning- from- 'success stories'" course component, Day 3, 1/2 day)
- Fieldwork (a "learning-by-doing" course component, Day 4 and 5, 1 1/2 days)
- Reporting to the plenary session (summarising the results of the fieldwork course component, Day 5, 1/2 day)
- Summing up the Mode 2 pilot course."

Looking back, looking forward

Looking at the process retrospectively, we can notice that there were no clear strategic objectives for the whole Programme formulated in the application text of March 1999, even if each description of the national course contained its own goal. Yet, the evaluative discussions brought about both learning results at a practical pedagogical level, as well as at the strategic level of the status of research education for design practitioners in Scandinavia as a whole. Primarily, as expressed in the application text of August 2001, and before the evaluation meeting, the Network considered the possibility of proposing both Mode 1- and Mode 2-related courses as the subject of future co-operation, but it was abandoned after a thorough discussion during the evaluation meeting, and the focus was then laid on Mode 2 only. The closing discussions of the Network made it clear that future co-operation should have a more specific character, that of experiment courses, which aim to develop Mode 2 research education.

The Millennium Programme was a product of a 10 year long tradition of continuous debate on the content and modes of research education. As a process it resulted in a broader overview and a deeper insight into certain pedagogical experiences, its failures and successes. It has given ample time and social opportunities to being better acquainted with each other in the Scandinavian research education milieu. However, the long conversations in and outside the lecture and seminar rooms, made it clear that our institutions are mature enough to offer such education on their own at the Mode 1 level. Notwithstanding, the maintaining and strengthening of the academic ties which the Millenium Programme created, should be sustained through a continuous interchange of some sort. For instance, these national courses should be opened for external Scandinavian auditors and some of them organised as short duration course blocks for practical purposes. The applauded process of academic consolidation could continue through yearly "summits" of doctoral schools, possibly in connection with the annual meetings of the Nordic Architectural Research (Nordisk Arkitekturforskning).

The next phase of Network co-operation aims to expand the continuous research education offers organised by the Quadrologue Network with a focus on Mode 2-related courses. The pilot course is to be given in Oslo in January/February 2003. In the future both Mode 1- and Mode 2- related courses could be opened to PhD students from outside Scandinavia, as the Quadrologue Network believes that the research education competence developed here, in the North of Europe, should be shared with others.

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APPENDIX I

The 'Millenium Programme' Staff

Oslo Course

Richard Buchanan, PhD, Professor, Director, School of Design, Carnegie Mellon University, Pittsburgh, USA

Jonathan Woodham, PhD, Professor, Director, Design History Research Centre, University of Brighton, U.K.

Halina Dunin-Woyseth, Professor, Dr. , Director, Doctoral Programme, co-responsible for the Oslo Course, Oslo School of Architecture, *the Norwegian member of the Millennium Network*

Matthias Kaiser, Professor, Dr., Doctoral Programme, Oslo School of Architecture / University of Oslo (NENT)

Jan Michl, Professor, Dr., Director, Institute of Industrial Design, responsible for the Oslo Course, Oslo School of Architecture

Eivind Kasa, Associate Professor, Dr., Institute of History and Theory of Design & Architecture, Norwegian University of Science and Technology, Trondheim

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Stockholm Course

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Rolf Hughes, PhD in Creative Writing, East Anglia University,

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Aarhus Course

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Helsinki Course

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The 'Millennium Programme' Secretariat

Ingunn Gjørva, Executive Officer, Oslo School of Architecture, Research Secretariat

APPENDIX II
The 'Millenium Programme' PhD Students' Participation

Denmark

(AAA)	Charlotte Bundgaard (Aa)
(AAA)	Jonna Majgaard Krarup (O, S, Aa, H)
(AAA)	Helene Bang Nielsen (O, S, Aa, H)
(AAA)	Trine Agervig Jensen (Aa)
(OdU)	Hans Christian Jensen (Aa)
(AaU)	Thomas Arvid Jaeger (O, S, Aa, H)
(AaU)	Ole Phil (O, S, Aa, H)
(AaU)	Kåre Eriksen (O, S)
(KA)	Bettina Lamm (O, S)
(KA)	Camilla Ryhl (O, S)
(AAA)	Shelley Smith (Aa)
(AAA)	Nicolai Steinø (Aa)
(KA)	Katrine Frandsen (S)

Finland

(THH)	Sari Tähtinen (O, S, H)
(OU)	Aulikki Herneoja (O, S, Aa, H)
(UIHA)	Kivi Sotamaa (O, S, H)
(OU)	Juho Rajaniemi (O, S, Aa, H)
(UIHA)	Päivi Jääskeläinen (O, S, H)
(THH)	Markku Hedman (O, S, Aa, H)
(UIAH)	Sonja Iltanen (H)
(UIAH)	Antero Innamaa (H)
(THH)	Maarit Kaipiainen (H)
(UIAH)	Ritva Lappalainen (H)
(OU)	Henrika Ojala (H)
(THH)	Jyrki Tarpio (H)
(THH)	Sari Tähtinen (H)
(UIAH)	Teppo Vahteristo (H)
(UIAH)	Esa Vesmanen (H)
(THH)	Eva Wiklund (H)

Norway

(AHO)	Jan Capjon (O, S, Aa, H)
(AHO)	Øystein Cruikshank (O, S, Aa, H)
(AHO)	Lykke Frydenlund (O, S)
(AHO)	Marte Gulliksen (H)
(AHO)	Riri Klingenberg Green (O, S, Aa, H)
(AHO)	Mitra Hedman (H)
(AHO)	Lars Jacob Hvinden-Haug (O, S, Aa, H)
(AHO)	Sture Kvarv (O, S, Aa, H)
(AHO)	Torben Lai (O, S, Aa, H)
(NTNU)	Randi Narvestad (O, S, Aa, H)
(AHO)	Ståle Stenslie (O, S, Aa, H)
(AHO)	Arild Walther-Jacobsen (O, S, H)
(AHO)	Bente Ytterstad (O, S, Aa)

Sverige

(KTH)	Åsa Dahlin (O, S, Aa, H)
(LTH)	Mårten Dunér (O, S, Aa)
(CTH)	Kristina Grange (O, S, H)
(KTH)	Maud Hårleman (O, S, H)
(KTH)	Ulrika Karlsson (O, Aa, H)
(LTH)	Matthias Kärrholm (O, S, Aa)
(CTH)	Gabriella Olshammer (Aa)
(CTH)	Nina Ryd (O, S)
(SLU)	Maike Schalk (S, Aa, H)

Initials of the institutions (in Scandinavian languages) : KA (Kunstakademiets Arkitektskole, The Royal Academy of Arts, School of Architecture, Copenhagen); AAA (Aarhus Arkitektskole, Aarhus School of Architecture, Aarhus); OU (Uleåborg Universitet, Arkitekturfakultet, Oulu University, Faculty of Architecture, Oulu), THH (Tekniska Högskolan i Helsingfors, Technical University of Helsinki, Faculty of Architecture), UIAH (University of Art and Design Helsinki); LTH (Lunds tekniska högskola, Arkitektskolan, Lund Technical University, School of Architecture); KTH (Kungliga Tekniska Högskolan, Arkitekturskolan, KTH Royal Institute of Technology, School of Architecture, Stockholm); AHO (Arkitekthøgskolen i Oslo, Oslo School of Architecture); NTNU (Norges teknisk-vitenskapelig universitet, Fakultet for Arkitektur, plan og billedkunst, Norwegian University of Science and Technology, Faculty of Architecture, Planning and Arts); OdU (Odense Universitet/ Syddansk Universitet, Odense University, Odense); SLU (Uppsala Universitet, Fakultet for Landskapsarkitektur, Uppsala University, Department of Landscape Planning, SLU Alnarp)

Participation in the national research courses indicates as follows: O(slo), S(tockholm), Aa(rhus), H(elsinki)