

Centre for Advanced Study

at the Norwegian Academy of Science and Letters

Annual Report 2006





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Centre for Advanced Study

The Centre for Advanced Study (CAS) is a private foundation. It was established by the Norwegian Academy of Science and Letters in 1989, and its activities commenced in full from the autumn of 1992. Its purpose is to raise the calibre of Norwegian basic research and interdisciplinary theoretical work up to the highest international level in the humanities/theology, social sciences/law, natural sciences/medicine and mathematics. The Centre rents premises from the Norwegian Academy of Science and Letters at Drammensveien 78, NO-0271 Oslo.

Outstanding researchers from Norway and abroad are nominated for one-year stays in the Centre. The activities are organized in three groups – one in the humanities, one in the social sciences and one in the natural sciences – each with from six to ten members whose affiliation is long-term. In addition, numerous researchers spend shorter periods conducting research, altogether some 40–45 researchers of 10 to 15 nationalities a year. Each group is planned and organized around a unifying theme and headed by one or more outstanding researchers. The groups have no other obligations than their own research. They receive administrative and financial support from the Centre in formalized cooperation with six Norwegian universities and one high-level research college, i.e. the University of Oslo, the University of Stavanger, the University of Bergen, the University of Tromsø, the Norwegian University of Science and Technology in Trondheim, the Norwegian University of Life Sciences in Ås and the Norwegian School of Economics and Business Administration in Bergen.

The Centre has a Board appointed by the Norwegian Academy of Science and Letters, the Norwegian Association of Higher Education Institutions and the Research Council of Norway.

Abbreviations used in the Annual Report

CAS	Centre for Advanced Study
KD	Ministry of Education and Research
NASL	Norwegian Academy of Science and Letters
NetIAS	European Network of Institutes of Advanced Study
NTNU	The Norwegian University of Science and Technology
RCN	The Research Council of Norway
UHR	The Norwegian Association of Higher Education Institutions
UiS	University of Stavanger
UiT	University of Tromsø
USIT	University of Oslo's Centre for Information Technology
UiB	University of Bergen
UiO	University of Oslo

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The Board

Professor Aanund Hylland
Chair
University of Oslo – NASL



Professor Liv Bliksrud
University of Oslo – NASL

Pro-Rector Gerd Bjørhovde
Deputy Chair
University of Tromsø – UHR



Professor Eivind Hiis Hauge
The Norwegian University of
Science and Technology – UHR

Professor Kenneth Hugdahl
University of Bergen – NASL



Professor Leif Arne Heløe
Norwegian Institute for Urban
and Regional Research – RCN

Professor Ivar B. Ramberg
Alternate (for Hylland)
Ramberg Consulting AS
– NASL



Professor Jens G. H. Iversen
Alternate (for Hugdahl)
University of Oslo – NASL
until 30.06.2006

Rector Sigmund Grønmo
Alternate (for Bjørhovde)
University of Bergen – UHR



Professor Egil Leer
Alternate (for Hugdahl)
University of Oslo – NASL
from 30.06.2006

Professor Lars Walløe
Alternate (for Bliksrud)
University of Oslo – NASL



Secretary General Anne Lise Ryel
Alternate (for Heløe)
The Norwegian Cancer Society
– RCN

Professor Rune Nilsen
Alternate (for Hauge)
University of Bergen – UHR



Secretary General Professor
Reidun Sirevåg
Observer
The Norwegian Academy of
Science and Letters

The administration

Professor Willy Østreng
Scientific Director



Unn Haaheim Hagen
Office Manager

Maria M. L. Sætre
Adviser



Marit Finnemyhr Strøm
Executive Officer

Research groups 2005/2006

Participants spring 2006

Narrative Theory and Analysis



Jakob Lothe
Professor,
University of Oslo,
Norway
Group Leader



Jeremy Hawthorn
Professor,
University of
Science and
Technology
(NTNU), Norway



Susan R.
Suleiman
Professor,
Harvard
University, USA



Daphna Erdinast-
Vulcan
Professor,
University of
Haifa, Israel



Beatrice
Sandberg
Professor,
University of
Bergen, Norway



Anne Helene
Thelle
Research Fellow,
University of Oslo,
Norway



Anniken Greve
Associate
Professor,
University of
Tromsø, Norway



Anette Storeide
Research Fellow,
University of Oslo,
Norway

Statistical Analysis of Complex Event History Data



Odd O. Aalen
Professor,
University of Oslo,
Norway
Group Leader



Ørnulf Borgan
Professor,
University of Oslo,
Norway
Group Leader



Vanessa Didelez
Lecturer,
University College
London, UK



Axel Gandy
Research Fellow,
University of Ulm,
Germany



Hege Marie
Bøvelstad
Student,
University of Oslo,
Norway



Jon Michael Gran
Research Fellow,
University of Oslo,
Norway



Nina Gunnes
Research Fellow,
University of Oslo,
Norway

Environmental Economics: Policy Instruments, Technology Development, and International Cooperation



Robin Henderson
Professor,
University of
Newcastle upon
Tyne, UK



Thomas Scheike
Associate
Professor,
Copenhagen
University,
Denmark



Michael Hoel
Professor,
University of Oslo,
Norway
Group Leader



Rolf Golombek
Senior Research
Fellow, The
Ragnar Frisch
Centre for
Economic
Research, Norway



Matti Liski
Adjunct Professor,
Helsinki School
of Economics,
Finland



Niels Keiding
Professor,
Copenhagen
University,
Denmark



Ståle Nygård
Research Fellow,
University of Oslo,
Norway



Reyer Gerlagh
Associate
Professor, Vrije
Universiteit, The
Netherlands



Cathrine Hagem
Post Doctorate
Fellow, University
of Oslo, Norway



Michael Rauscher
Professor,
University of
Rostock,
Germany



Nils Lid Hjort
Professor,
University of Oslo,
Norway



**Torben
Martinussen**
Associate
Professor, Royal
Veterinary and
Agricultural
University,
Denmark



Johan Eyckmans
Associate
Professor,
European
University
College Brussels
and Katholieke
Universiteit
Leuven, Belgium



Snorre Kverndokk
Senior Research
Fellow, The
Ragnar Frisch
Centre for
Economic
Research, Norway



Aart de Zeeuw
Professor, Tilburg
University, The
Netherlands

Research groups 2006/2007

Participants autumn 2006

Metamorphoses: Resurrection, Taxonomies and Transformative Practices in Early Christianity



Turid Karlsen Seim
Professor,
University of Oslo,
Norway
Group Leader



Hugo Lundhaug
Researcher,
University of Oslo,
Norway



Jorunn Økland
Senior Lecturer,
University of
Sheffield, UK



István Czachesz
Post Doctoral
Fellow, University
of Groningen, The
Netherlands



Samuel Rubenson
Professor, Lund
University,
Sweden



Outi Lehtipuu
Researcher,
University of
Helsinki, Finland



Vigdis Songe-Møller
Professor,
University of
Bergen, Norway

Spin and Charge Flow in Nanostructures



Arne Brataas
Professor,
Norwegian
University of
Science and
Technology
(NTNU), Norway
Group Leader



Asle Sudbø
Professor,
Norwegian
University of
Science and
Technology
(NTNU), Norway
Group Leader



Jan Martinek
Researcher,
Polish Academy
of Sciences,
Poland



Flavio S. Nogueira
Assistant
Professor, Freie
Universität Berlin,
Germany



Anatoliy Mal'shukov
Professor,
Russian Academy
of Sciences,
Russia



Yaroslav Tserkovnyak
Assistant
Professor,
University of
California, Los
Angeles, USA

Changing Family Patterns in Norway and other Industrialized Countries: Determinants, Consequences and Projected Trends



Lu-Yao Wang
Research fellow,
National Chiao-
Tung University,
Taiwan



Jan Petter Morten
Research Fellow,
Norwegian
University of
Science and
Technology
(NTNU), Norway



Nico Keilman
Professor,
University of Oslo,
Norway
Group Leader



Øystein Kravdal
Professor,
University of Oslo,
Norway
Group Leader



Anne Reneflot
Research Fellow,
University of Oslo,
Norway



Malek Zareyan
Assistant
Professor,
Institute for
Advanced Studies
in Basic Sciences,
Zanjan, Iran



Torkild Lyngstad
Researcher,
Statistics Norway,
Norway



Sverren-Erik
Mamelund
Post Doctoral
Fellow, University
of Oslo, Norway



Ronald Rindfuss
Professor,
University of
North Carolina at
Chapel Hill, USA



Steinar Kragset
Postdoctoral
Fellow, Norwegian
University of
Science and
Technology
(NTNU), Norway



Hans Henrik Bull
Researcher,
University of Oslo,
Norway



Michael Murphy
Professor,
London School of
Economics and
Political Science,
UK



Vegard Skirbekk
Research Scholar,
International
Institute for
Applied Systems
Analysis (IIASA),
Austria

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1. Administrative Affairs

The Board is the Centre's supreme governing body. Its composition is regulated by §4 of the Memorandum of Association, which reads as follows:

“The Board of the Norwegian Academy of Science and Letters (NASL) and the Norwegian Association of Higher Education Institutions (UHR) each appoint two members with alternates to the Board of the Centre. In agreement with the Norwegian Association of Higher Education Institutions, the Academy appoints a member to be Chair of the Board, as well as this member's alternate. ... The State appoints the sixth member of the Board. In agreement with the Norwegian Association of Higher Education Institutions, the Academy appoints one of the other members to be deputy chair of the Board. ... The Board of the Norwegian Academy of Science and Letters is entitled to appoint one of its members to serve as an observer of the Board of the Centre for Advanced Study.” The State's representative is appointed by the Research Council of Norway (RCN).

In 2006, the Board was composed of the following members:

Professor Aanund Hylland, University of Oslo (Chair) – NASL
Prorector Gerd Bjørhovde, University of Tromsø (Deputy Chair) – UHR
Professor Kenneth Hugdahl, University of Bergen – NASL
Professor Liv Bliksrud, University of Oslo – NASL
Professor Eivind Hiis Hauge, Norwegian University of Science
and Technology – UHR
Professor Leif Arne Heløe, the Norwegian Institute for Urban
and Regional Research – RCN
Secretary General Professor Reidun Sirevåg, observer for NASL

Alternates:

Professor Ivar B. Ramberg, Ramberg Consulting AS – NASL (for Hylland)
Rector Sigmund Grønmo, University of Bergen – UHR (for Bjørhovde)
Professor Jens G. H. Iversen, University of Oslo – NASL (for Hugdahl)
until 30 June 2006
Professor Egil Leer, University of Oslo – NASL (for Hugdahl)
from 30 June 2006
Professor Lars Walløe, University of Oslo – NASL (for Bliksrud)
Professor Rune Nilsen, University of Bergen – UHR (for Hiis Hauge)
Secretary General Anne Lise Ryel, The Cancer Society – RCN (for Heløe)

The Board of Directors had 4 meetings in 2006. The following main issues were discussed and/or decided:

Selection of research groups for 2008/2009 – Financial Statements for 2005 – Budget for 2006 – Annual Report for 2005 – Application for funds from the Ministry of Education and Research 2007 – Half-year accounts for 2006 – The transfer of funds to the Operating Fund – The establishment of a budgetary item to strengthen the Centre's interdisciplinary research – The redistribution of funding among the research groups in 2005/2006 – The final revision of the cooperation agreement with the University of Tromsø (UIT) – The process of finding candidates for 2009/2010 – An evaluation of the appointment process for research groups in 2008/2009 – The length of resident associate stays at the Centre – Participation in the *European Network of Institutes of Advanced Study* (NetIAS) – Cooperation with CAS' sister organisations in the Nordic countries – The organisation of a seminar on *Outstanding Research*

in Norway – The establishment of a Wages Committee and wage adjustments – The renewal of cooperation agreements with the University of Bergen (UiB), the University of Oslo (UiO) and the Norwegian University of Science and Technology (NTNU) – Discussion of the progress made by the research groups in 2006/2007 – Discussion of the quality criteria for scientific publications under the auspices of the Centre – Miscellaneous refurbishment and maintenance projects.

1.1 Management and administration

The administration consisted of four employees and two part-time independent consultants. Willy Østreng is employed as Scientific Director on a fixed-term contract and is responsible for the Centre's routine operations and academic activities. Office Manager Unn Haaheim Hagen heads the routine administrative activities, while Adviser Maria M. L. Sætre's main purview is the administration of the Centre's technical operations, including updating and maintaining the website, handling the archives and library services and working with the Centre's publications. Executive Officer Marit Finnemyhr Strøm is in charge of the switchboard, the registration of researchers, postal services and information services as well as general administrative assistance. In addition, Project Manager Bjarne Røsjø of *Faktotum Informasjon A/S* has co-edited the CAS Newsletter and been involved in the production of the Centre's book project: *Cosilience. Interdisciplinary Communications 2005/2006* and the *Annual Report for 2005*. Gorm Johnsen of the *University of Oslo's Centre for Information Technology (USIT)* was responsible for operating the computer systems and providing computer support for the researchers. Since 21 August 2006, these duties have been handled by Torben Rønneberg who works at the Centre two days a week – Tuesdays and Thursdays. Temporary office help has been hired on an hourly basis to lighten the workload as needed.

The regular administrative staff has weekly meetings to discuss matters of importance to ongoing activities. Several meetings were also held between the administration and the heads of the research groups invited to work at the Centre. These meetings were organised to help the groups plan their stays. Experience indicates that groups which invest effort in the planning stage get more out of their stays. Consequently, considerable importance is attached to these meetings.

Cooperation with the Contact Committees at the six universities and the Norwegian School of Economics and Business Administration (NHH) has been further strengthened, not least through the reorganisation of the committees and the continuation of the annual meetings between these committees and the Scientific Director. The Contact Committees, previously comprised of professionals recruited by the Centre, have been replaced by the universities' own research policy units, e.g. research boards, research committees and/or deans' offices. This change ensures that the Centre's programmes receive more attention from our partners than was previously the case. At the same time, the Scientific Director meets university administrators directly by virtue of the meetings of these committees.

The negotiations for a revision of the cooperation agreement with UiT were concluded on 1 June 2006. Consensus was reached on the question of whether the agreement would have the same wording as the cooperation agreements the Centre has with its other six partners. This entails, for example, that researchers from UiT who are invited to CAS will be granted extraordinary sabbaticals and receive full pay from the university.

The negotiations for a prolongation of the cooperation agreement CAS has with UiB, UiO and NTNU were concluded during the period. Most of the wording in the agreement from the preceding agreement period was carried over and clarified for a new five-year period beginning on 1 January 2007.

Among its professional initiatives, the Centre continued arranging Wednesday seminars in 2006. These seminars are intended to encourage communication, dialogue and contact across fields of research, groups and disciplines. This initiative is one of several designed to contribute to the Centre's interdisciplinary objective and image. As from 2007, a separate budgetary item has been set up for additional financial support for the interdisciplinary groups. From 2007, the Centre will also emphasise the desirability of recruiting interdisciplinary groups in its annual calls for proposals.

The Editorial Board of the CAS Newsletter has planning meetings in advance of every publication, based on prior discussions at the administrative meetings. Every issue of the CAS Newsletter contains discussions of the research groups' work and an editorial that addresses relevant research policy topics

of interest and significance to the Centre's activities. It has also been decided to enhance the general scientific popularity of the magazine by publishing themed issues on the humanities, social sciences and natural sciences.

1.2 Other issues

Based on the feedback the administration has received from researchers, the working environment at the Centre is considered good. Absence due to illness totalled 16 days in 2006. The organisation's activities do not pollute the outdoor environment.

2. The Purpose and Work of the Centre

The Centre considers it important to continue its efforts to achieve the objectives enshrined in §2 of the Memorandum of Association:

- A. The academic activity at the Centre shall be known to satisfy the highest international standards and thereby contribute to raising the level of basic and interdisciplinary theoretical research in Norway within the fields of the humanities/theology, social science subjects/law and the natural sciences/medicine/mathematics.
- B. The Centre shall provide opportunities for researchers to work undisturbed on problems that need not show short-term returns.
- C. The academic activity of the Centre shall be long-term, independent and of a permanent nature.
- D. The Centre shall be a national institution, and contribute to widely publicising the results that are produced.
- E. The Centre shall provide the setting for close academic cooperation between researchers from Norway and abroad.

One important element in the efforts to reach these goals is the recruitment of researchers who have achieved academic results of a high international calibre. At the same time, the Centre wishes to encourage the broadest possible cooperation within the framework of the system of thematic group. This form of teamwork appears to be functioning extremely well with the size, the academic weight and the youthful constituents (at the post-doctoral

level) of each group. The social and academic contact among the three thematic groups strengthens the scholarly atmosphere as well as the social sense of community at the Centre. The weekly Wednesday seminars are one of several measures to promote contact across disciplinary and thematic divisions. A total of 32 joint seminars were organised in 2006. In 2007, the Centre published the book: *Consilience. Interdisciplinary Communications 2005/2006*, based on the lectures delivered at these seminars. The contributions to this book, the third in a series of annual publications, have been peer reviewed. The series is edited by the Scientific Director and has been well received in the national as well as the international arena.

The increases in the budget from the Ministry of Education and Research from 1998 to 2002 enabled the Centre to improve the administrative services offered to Resident Associates and paved the way for increasing direct financial support to the projects. Both have helped make the Centre a more attractive place for prominent researchers. However, since 2002, the actual value of the State subsidy has stagnated, reducing opportunities for further improvements (see below).

The three groups have six offices each available to them, several of which can accommodate more than one researcher. Meanwhile, the facilities get crowded from time to time and more office space would be desirable. The Norwegian Academy of Science and Letters has a great need for more offices for its own purposes and has not been able to accommodate our desire.

3. Research Groups and Academic Activity

The three groups that started their work in autumn 2005 and continued in spring 2006, worked on the following topics:

- *Narrative Theory and Analysis*
headed by Professor Jakob Lothe, University of Oslo
- *Environmental Economics: Policy Instruments, Technology Development, and International Cooperation*
headed by Professor Michael Hoel, University of Oslo

- ***Statistical Analysis of Complex Event History Data***

headed by professors Odd O. Aalen and Ørnulf Borgan, University of Oslo

The project *Narrative Theory and Analysis* took its point of departure in the premise that no human culture can emerge and/or endure without defining itself by means of telling stories. Based on narrative theory, an expansive, interdisciplinary field of research, the research group set out to study literary fiction, filmic fiction and historical stories. In these efforts, the group assumed that there is a close connection between narrative theory and analysis, and that the way in which a story is structured and understood has major consequences on its interpretation. The group chose to study two problem areas: 1. Analysis of modernist narrative, concentrating on the fiction of Joseph Conrad and Franz Kafka. Modernistic fiction as reflected in the authorships of Conrad and Kafka challenges narrative theory and analysis by problematising the premises of realistic narrative. 2. Theoretical survey of stories concentrated on the relationship between fiction and history. The research group concentrated on the narrative representation of and different types of responses to the Holocaust. Narrative presentations of the Holocaust can be both auto-biographical and fictitious. In studying both varieties, the group focused on the complex and changing relationship between past and present self-understanding as it appears in first-hand auto-biographical stories and in fictitious Holocaust stories. For a more comprehensive presentation of the project and its provisional results, see the group's report in this Annual Report.

The project *Environmental Economics: Policy Instruments, Technological Development and International Cooperation* took its point of departure in the premise that reality is far more complex than simple economic models often assume. This implies that knowledge about characteristics attached to different environmental economic policy instruments is limited, and that the advantages and disadvantages of these policy instruments are only known to the rest of the economy under certain circumstances. The purpose of the project was therefore to increase knowledge about the characteristics of several types of economic environmental policy instruments. In these efforts, the group included several central characteristics of the economy which had been omitted from earlier analyses, such as the distorting effects of direct and indirect taxes, endogenous technological development, dynamics, irreversibility and time consistency, enterprises and market power, international trade, international and interregional environmental issues and limited ration-

ality, altruism and dependence between individuals' preferences. For a more comprehensive presentation of the project and its provisional results, see the group's report further back in this Annual Report.

The project *Statistical Analysis of Complex Event History Data* was intended to contribute to the development of statistical methods for dealing with complex event history data. Event history analysis is used to analyse the incidence and prognosis of cancer and other chronic diseases. It constitutes a set of statistical methods used to analyse and describe life times, durations and more complex event history data. The analysis of complex event history data with many events and additional information (covariates) is still not well developed. For example, the success of treatments should not merely be measured by how long a patient lives, but also by how the disease develops with a view to periods of remission and quality of life. In the light of this, the group aspired to: 1. study the connection with modern theories of causality, 2. study methods to deal with observed heterogeneity in a realistic manner, 3. study methods for incorporating high dimension genomic data in survival and event history analysis, 4. develop alternatives to the classical Cox-regression which is more appropriate for dealing with dynamic covariates and time-dependent covariate-effects and 5. develop acceptable summary measures for complex event histories. For a more comprehensive presentation of the project and its provisional results, see the group's report in this Annual Report.

The 2006/2007 research groups commenced working in August 2006. The research topics for these groups are:

- ***Metamorphoses: Resurrection, Taxonomies and Transformative Practices in Early Christianity***, headed by Professor Turid Karlsen Seim, University of Oslo
- ***Changing Family Patterns in Norway and other Industrialised Countries: Determinants, Consequences and Projected Trends***, headed by professors Øystein Kravdal and Nico Keilman, University of Oslo
- ***Spin and Charge Flow in Nanostructures***, headed by professors Arne Brataas and Asle Sudbø, Norwegian University of Science and Technology

CAS Newsletter No. 2, 2005, describes the 2005/2006 groups' activities, while CAS Newsletter No. 1, 2006, discusses selected research topics for these projects.

CAS Newsletter No. 2, 2006, describes the 2006/2007 groups' activities.

CAS Newsletters are available in English and Norwegian versions and are posted on the Centre's website at: www.cas.uio.no.

In June 2006, the Board made its final decision on the selection of the groups to be invited to the Centre in 2008/2009. The Centre had received 25 nominations, an increase from the year before. Four of the nominees subsequently withdrew owing to time pressures and heavy workloads. Following two rounds of discussion, the Board forwarded 11 proposals to an international peer review in spring 2006. A total of 61 evaluation reports were submitted by prominent independent international researchers. Based on the evaluations, the Board decided to invite the following research groups to the Centre in 2008/2009:

- ***Early Networking in Northern Fennoscandia***,
headed by Professor Charlotte Damm, University of Tromsø
- ***Understanding the Role of Water in Development and History***,
headed by Professor Terje Tvedt, University of Bergen
- ***Nonlinear Partial Differential Equations***,
headed by professors Helge Holden, Norwegian University of Science and Technology and Kenneth H. Karlsen, University of Oslo

The selection process for 2009/2010 was initiated in autumn 2006. The Centre received no fewer than 21 nominations, of which 18 moved on to the next round.

4. Other Academic Activities

In 2006, the Scientific Director produced several publications, e.g. editing a book and having articles accepted by peer-reviewed journals. He was also invited to address national and international conferences and meetings in his field of research.

5. Objectives and Results

During the year, 81 researchers made professional contributions to the Centre's six projects. Of that number, 57 Resident Associates had longer stays (from one to eleven months) at the Centre, of which 28 were non-Norwegians. There has been a significant international element; 45 researchers from 17 countries¹ and four continents participated in the research. Of that number, 15 were women. The number of younger researchers was also substantial in 2006: six post-doc fellowships and eight PhD students.

In spring 2006, 42 Resident Associates worked at the Centre, 31 of whom had long-term stays. Of that number, 19 were Norwegian and 23 were from other countries. During this period, the Centre was the place of work for three post-doc fellowships and four PhD students. In addition, a large number of seminar and conference participants provided professional contributions to the individual project groups, cf. the group reports further back in this Annual Report.

In autumn 2006, 39 Resident Associates worked at the Centre. Of that number, 26 longer stays were divided equally between Norwegian and foreign researchers. There were also many external seminar and conference participants.

Major seminars and workshops with broad national and international participation have now become a natural part of the academic activity of all the groups. In 2006, the Centre organised 10 workshops/seminars of this type. Several of the groups have also planned summing up and evaluation seminars to follow up their stays at CAS. In addition, a series of internal working seminars was organised within and between the groups, (cf. the group reports further back in this Annual Report).

The interaction between the researchers from abroad and those from Norway and the many lectures given by the researchers from abroad at Norwegian universities and in other academic fora represent an important contribution

1 Belgium, Brazil, Denmark, Finland, France, Israel, Iran, Japan, the Netherlands, Poland, Russia, Great Britain, Sweden, Taiwan, Germany, Hungary and the USA

to the internationalisation of Norwegian research in general and represent significant results in themselves, (cf. the group reports further back in this Annual Report).

The Centre is expecting numerous peer-evaluated publications in the form of books and articles in international journals as a result of its activities. Owing to the long lead time for the printing process, it is not possible at present to provide a complete survey of the results of the work done in 2006. Some works have already been published, but most of them are either being evaluated, are available in manuscript form or are still being drawn up and evaluated. A complete survey of the results of the work carried out during the year will not be available for several years. The reports from the three research groups for 2005/2006 show that the provisional figure for published reports and/or reports in progress or that have been sent for publication has already reached a total of 175 works, including several books. To this may be added the 32 articles published in the book: *Convergence. Interdisciplinary Communications 2004/2005*, CAS, Oslo 2005. In this context, it should be mentioned that one of the books: Jakob Lothe and Anette Storeide (eds.): *Tidsvitner: Fortellinger fra Auschwitz og Sachsenhausen* (Time Witnesses: Narratives from Auschwitz and Sachsenhausen), Gyldendal, Oslo 2006, was named **Book of the Year** by the Norwegian newspaper *Morgenbladet's* readers, at the same time as it did well on publisher's sales lists in autumn 2006. Several foreign publishing houses have expressed interest in having the work translated and published in other countries.

The following goals were also reached in 2006

- The selection procedure for new research groups maintains a high international standard and is being improved continuously. Selection spans an 8-month period before the nine best projects are subjected to independent international evaluation. The 'finalists' for the 2008/2009 academic year were evaluated by an average of 5.5 peers from several countries.
- The CAS Newsletter maintains a high standard. It is published twice a year in Norwegian (circulation: 12 000) and English (circulation: 1000) versions. The CAS Newsletter is distributed to all scientific staff employed by universities in Norway, and to foreign researchers who have previously been affiliated with the Centre. In addition, the CAS Newsletter is sent to the press, the Storting, relevant ministries and other interested parties.

- Contact with Norwegian researchers outside the Oslo area has improved. In 2008/2009, 18 of a total of 25 group leaders were nominated by partners other than the University of Oslo. The University of Bergen submitted five nominations and the Norwegian University of Science and Technology submitted six. It was also gratifying that the University of Life Sciences, which first joined this network in 2005, nominated four applicants. This tendency was corroborated once again for the 2009/2010 academic year when 16 of a total of 21 nominations came from partners outside the Oslo area.
- Contact with the various disciplines is ensured through the Contact Committees that have been established at all the universities and the Norwegian School of Economics and Business Administration. The scheme works well, not least after the Contact Committees became identical with the institutions' central research bodies. In some places, the deans' offices serve as the Contact Committee, while special research committees have been appointed other places. After this change, CAS has direct access to trend setters and decision-makers among its partners. This has enhanced the value and the importance of the annual meetings the Scientific Director has with the Contact Committees.
- The revision of the cooperation agreement with the University of Tromsø was concluded in 2006, entailing that the agreement is now identical to the other cooperation agreements signed by CAS.
- Certain academic seminars under the auspices of the Centre have been organised at universities outside Oslo. The objective is to give more professionals than those directly involved in the group work at CAS the opportunity to be involved in the Centre's work by participating in discussions. This will help expand the Centre's national impact area to comprise more professionals than those who are members of the respective groups. The Centre will examine the possibility for further developing this programme and making it a more permanent part of CAS' cooperation with universities and colleges.
- The excellent, constructive and mutually binding cooperation with other academic and research administration institutions in Norway, e.g. the Norwegian Academy of Science and Letters (NASL), the Norwegian Association of Higher Education Institutions (UHR) and the Research Council of Norway (RCN), was carried further during the period covered by this report, not least through the planning and implementation of joint research policy events (see the next bullet point).

- On 30 October 2006, CAS, UHR and RCN organised a full-day seminar on the criteria for *Outstanding Research in Norway*. The seminar, which gathered 82 participants at a high political and academic level, gave rise to a debate in the press in the weeks following the seminar.
- Efforts to establish closer contact with international sister organisations were further strengthened in 2006. This was mainly achieved through work in *NetIAS* aimed at earning CAS and its European sister organisations a role in the formulation of the EU's Framework Programmes, and to be defined as qualifying for EU research funding. CAS also took the initiative to bring together Nordic sister organisations at a meeting at Uppsala University in spring 2006. The purpose of the meeting was to investigate the possibility of implementing joint projects on a Nordic basis and to strengthen the Nordic influence in NetIAS. Consideration is being given to organising a follow-up meeting in Oslo in spring 2007.
- The interdisciplinary component of the Centre's work has been strengthened by the continuation of the weekly lunch seminars and the establishment of a separate budgetary item for this type of research. Moreover, future calls for proposals will urge candidates to draw up cross-sector project proposals.
- External mediation of research results takes place through peer-reviewed publication channels. Popularised articles are published in the CAS Newsletter and the book series *Interdisciplinary Communications*. The book series was established in 2003 as a measure to encourage the interdisciplinary component of the Centre's work and to reach readers outside circles of experts. The Book of the Year has now been published in a print-run of 900 copies and been distributed free of charge to a number of research groups in Norway and abroad. It has also been sent to interested institutions/individuals on request. It should be mentioned that the book: *Time witnesses: Narratives from Auschwitz and Sachsenhausen*, edited by Jakob Lothe and Anette Storeide, received considerable attention in the press, radio and TV, resulting in several external acknowledgements to the Centre and favourable attention being devoted to this research.

6. Financial Affairs

6.1 The Centre for Advanced Study

The State Grant for 2006 amounted to NOK 14 214 000. This marked an increase from the previous year of NOK 144 000, or 1 per cent. The increase did not compensate fully for inflation and wage adjustments, and has therefore not brought the Centre significantly closer to the grant target of about MNOK 15 that the evaluation committee (the Bjørgo Committee) recommended as early as in 1997. In nominal terms, that means the sum of approximately MNOK 1 still remains before the State grant reaches the recommended level. The absence of any real increases in the past three years means that the work of building up an adequate reference library and a collection of books and journals in science and the humanities is coming to a standstill. The same applies to the need for better computer support services for the researchers. CAS' sister organisations in other Western countries have full-time in-house computer consultants and librarians.

A reassignment of priorities in connection with the Centre's budget for 2005 made it possible to increase the allocations for 2005/2006 to MNOK 3 per research group. The funding for the groups in 2007/2008 has been increased to MNOK 3.2 per group. The funds that the Centre makes available to the three research groups are intended to cover general project costs as well as fellowships and buying out researchers from abroad, including accommodation, travel and conference and seminar expenses. Until recently, the available resources were far too limited for a sufficiently large number of leading international researchers to be brought to Norway as Resident Associates. To the extent that financial circumstances allow, the Centre will give more priority to this in future. To enable the Centre to buy out the best researchers from abroad for lengthy research stays, each project group would require about MNOK 1 more than today's allocation. In other words, each group should eventually have a budget of MNOK 4.2.

As in previous years, the university agreements represent considerable additional funding, since visiting researchers from the Norwegian universities and

the Norwegian School of Economics and Business Administration are in the main paid by their respective home institutions. This supplementary funding is equal to approximately 8 FTEs (full-time equivalents).

The Centre's Income Statement for 2006 shows an operating result of NOK 1 270 200. This sum represents transferable funds for the 2006/2007 research groups to use in spring 2007. These transfers are essentially the result of the fact that the academic year and the financial year do not coincide.

The balance sheet shows a balance of NOK 7 472 630. Of this amount, NOK 1 983 141 represents short-term debt. In 2006, the sum of NOK 4 000 000 was transferred from the Centre for Advanced Study to the Operating Fund at the Centre for Advanced Study.

The accounts for 2006 have been prepared on the going concern assumption. In the view of the Board, the annual financial statements submitted give a fair indication of the development and results of the activities at the Centre for Advanced Study as at 31 December 2006. The accounts have been audited by the company Nitschke A/S.

6.2 The Operating Fund at the Centre for Advanced Study

The Centre enters into binding agreements for up to three years in advance. The Operating Fund was established as a form of collateral for these long-term obligations. The Operating Fund consists of the basic capital, which is inviolable, and disposable funds. In February 2006, MNOK 4 was transferred to the Operating Fund from the total capital in the Centre's accounts. The amount was recognised directly against available funds. No funds were drawn from the Operating Fund in 2006. Net interest income came to NOK 304 949, which was added to the fund, bringing the Operating Fund's aggregate capital at year end to NOK 12 954 573.

Internal accounts for 2006 have been prepared on the basis of the going concern assumption. In the view of the Board, the annual financial statements submitted give a fair indication of the development and results of the activities of the Operating Fund at the Centre for Advanced Study as at 31 December 2006. The accounts have been audited by the company Nitschke A/S.

The Centre for Advanced Study, 22 February 2007



Outstanding Research in Norway

On 30 October 2006, CAS, UHR and RCN organised a full-day seminar on the criteria for *Outstanding Research in Norway*. The seminar, which gathered 82 participants at a high political and academic level, gave rise to a debate in the press in the weeks following the seminar.

The concluding panel debate was led by: (from left) Rector Jarle Aarbakke, UiT, Director General Arvid Hallén, RCN, Member of the Norwegian Parliament Ine Marie Eriksen Søreide, Rector Torbjørn Digernes, NTNU, Rector Sigmund Grønmo, UiB, and Rector Geir Ellingsrud, UiO.

To the Board of the Foundation
Centre for Advanced Study

AUDITORS' REPORT FOR 2006

We have audited the Annual Accounts of the Centre for Advanced Study for 2006, which show a surplus of NOK 1 452 522. We have also audited the information in the Annual Report concerning the Annual Accounts, and the going concern assumption. The Annual Accounts comprise the income statement, balance sheet and notes. The Accounts have been prepared in conformity with the Accounting Act and good auditing practice. The Annual Accounts and the Annual Report have been submitted by the Board of the Foundation. Our responsibility is to express an opinion on the annual accounts and other matters in accordance with the requirements of the Auditors Act.

We have performed our audit in conformity with the law, regulations and good auditing practice in Norway and auditing standards adopted by the Norwegian Institute of Public Accountants. The auditing standards require that we plan and conduct the audit in order to achieve a satisfactory level of certainty that the annual accounts do not contain any material errors or omissions. The audit comprises an examination of selected parts of the evidence in support of the information in the annual accounts, an assessment of the accounting principles applied and of important accounting estimates, and an evaluation of the content and presentation of the annual accounts. To the extent required by generally accepted standards of good auditing, the audit also includes an examination of the Foundation's asset management and of its accounting and internal control systems. We believe that our audit provides a satisfactory basis for our statement.

We are of the opinion that

- the annual accounts have been presented in conformity with legislation and regulations and reflect the Foundation's financial situation on 31 December 2006 and its result for the financial year in accordance with good auditing practice in Norway.
- the management has fulfilled its duty to ensure orderly and clear registration and documentation of information relating to the accounts in conformity with legislation and good accounting practice in Norway.
- the information in the Annual Report concerning the assumption that operations would continue is consistent with the annual accounts and is in conformity with statute law and regulations.

Stabekk, 22 February 2007

NITSCHKE AS

Morten Hurum
State-authorized auditor

7. Accounts

7.1 Accounts 2006 Centre for Advanced Study

Balance at 31 December		2006	2005
Assets:			
<i>Cash:</i>			
Cash, bank deposits etc.	(Note 5)	7 472 630	9 169 783
Other claims	(Note 6)	0	0
<i>Total cash:</i>		7 472 630	9 169 783
Total assets		7 472 630	9 169 783
Liabilities and capital and reserves;			
<i>Capital and reserves</i>			
Basic capital	(Note 7)	117 200	116 000
Capital account	(Note 9)	5 372 289	7 920 967
<i>Total capital and reserves</i>		5 489 489	8 036 967
<i>Short-term liabilities</i>			
Payable to the Norwegian Academy of Science and Letters		100 000	100 000
Payable tax deductions, National Insurance contributions, holiday pay etc.		434 309	371 780
Other short-term liabilities	(Note 8)	1 448 832	661 036
<i>Total short-term liabilities</i>		1 132 816	1 172 222
Total short-term liabilities		1 983 141	1 132 816

Oslo, 22 February 2007

Board of the Centre for Advanced Study

Aanund Hylland,
Chair of the Board

Gerd Bjørhovde,
Deputy Chair

Eivind Hiis Hauge

Kenneth Hugdahl

Leif Arne Heløe

Liv Blikrud

Income statement	2006	2005
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Income from operations and operating expenses:

Income from operations:

State grant from Ministry of Education and Research	14 214 000	14 070 000
The Research Council of Norway (Note 1)	0	100 000
<i>Total income from operations</i>	<i>14 214 000</i>	<i>14 170 000</i>

Operating expenses:

Expenses relating to research fellows (Note 2)	7 217 511	6 865 890
Salaries, fees etc. (Note 3)	2 356 761	2 180 559
Office furniture, furnishings, computer equipment	95 060	169 403
Other operating expenses (Note 4)	3 274 468	3 297 841
<i>Total operating expenses</i>	<i>12 943 800</i>	<i>12 513 693</i>

Operating result	1 270 200	1 656 307
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Financial income and financial expenditure:

Income from interest	193 651	154 181
Bank charges	11 329	8 113
Net financial income	182 322	146 068

<i>Annual balance</i>	<i>1 452 522</i>	<i>1 802 375</i>
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which is to be allocated as follows:

To the Basic capital	1 200	1 100
To/(from) the Capital account	1 451 322	1 801 275

Accounting principles:

The Accounts have been set out in conformity with the Accounting Act and good accounting practice.

Cash and short-term liabilities normally include items falling due within one year.

Pension premiums are linked to the employer's share of the premium payable to the Public Service Pension Fund.

The enterprise is required to have a service pension scheme under the Act relating to Obligatory Company Pensions; the enterprise has a pension plan that meets the requirements of this Act.

Notes on the Accounts

2006

2005

Note 1 Other contributions:

The Research Council of Norway	0	100 000
Sum;	0	100 000

Note 2 Expenses relating to research fellows:

Fellowships etc., researchers	3 006 896	2 971 636
Rent for researchers' flats	1 588 728	1 321 634
Travel expenses	615 491	623 341
Publications, printing, equipment	437 728	225 684
Seminars/Workshops	1 209 517	1 696 379
Miscellaneous expenses research groups	359 151	27 216
Sum;	7 217 511	6 865 890

Note 3 Salaries/fees:

Salaries/holiday pay	1 889 201	1 695 298
Pension premiums	172 790	180 696
National Insurance Contributions	253 865	240 840
Manpower services	1 706	13 750
Auditors' fees	34 125	38 125
Social expenditure	5 074	11 850
Sum;	2 356 761	2 180 559

Remuneration to Board members totalled NOK 40 000. The figures specified as Auditors' fees were in their entirety payment for auditing services.

Note 4 Other operating expenses	2006	2005
<u>Lighting, heating, cleaning, rent, insurance, security</u>	992 463	625 332
<u>Telephone, fax, postage</u>	131 570	198 731
<u>Equipment, copying, computing</u>	604 380	490 095
<u>Books, library service, printing</u>	536 388	757 847
<u>Operating equipment, maintenance</u>	215 629	368 603
<u>Running the canteen, social measures and representation</u>	394 994	425 348
<u>Travel expenses</u>	94 704	58 053
<u>Miscellaneous expenditure</u>	304 340	373 832
Sum;	3 274 468	3 297 841

Note 5 Bank deposits

Of the bank deposits, withholding tax accounted for NOK 224 511.

Specification of bank deposits on 31 December:

DnB NOR, account 8200.01.17044	NOK	224 511	219 256
DnB NOR, account 1607.83.68385	NOK	7 224 447	8 925 822
DnB NOR, account 1644.14.60264	NOK	4 539	4 433
<u>DnB NOR, account 8210.04.35809</u>	<u>NOK</u>	<u>1 561</u>	<u>1 514</u>
Total bank deposits	NOK	7 455 058	9 151 025
Cash balance 31.12.	NOK	17 572	18 757
Total cash, bank etc.	NOK	7 472 630	9 169 782

Note 6 Claims

Claims are put at their nominal value

Note 7 Basic capital

10% of a calculated yield on the Basic capital throughout the year is allocated to the Basic capital.

Note 8 Other short-term liabilities

This entry consists of items with a time limit at the end of the year.

Note 9 Capital Account

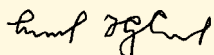
In 2006, NOK 4 000 000 was transferred to the Operating Fund of the Centre for Advanced Study. The amount was charged to capital accounts in 2006.

7.2 Accounts 2005 for the Operating Fund at the Centre for Advanced Study

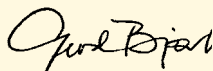
Balance sheet at 31 December	Notes	2006	2005
Assets:			
<i>Cash:</i>			
Bank deposit	Note 1	12 954 573	8 649 624
<i>Total cash</i>		<i>12 954 573</i>	<i>8 649 624</i>
Total assets		12 954 573	8 649 624
Liabilities and capital and reserves			
Capital and reserves:			
Basic capital	Note 2	1 306 710	1 276 210
Disposable funds	Note 3	11 647 863	7 373 414
<i>Total capital and reserves</i>		<i>12 954 573</i>	<i>8 649 624</i>
Total liabilities and capital and reserves		12 954 573	8 649 624

Oslo, 29 January 2007

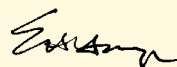
Board of the Centre for Advanced Study




Aanund Hylland,
Chair of the Board



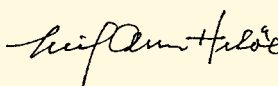
Gerd Bjørhovde,
Deputy Chair



Eivind Hiis Hauge



Kenneth Hugdahl



Leif Arne Heløe



Liv Blikrud

Income statement	2006	2005
Income:		
Income from interest	304 949	136 502
Annual balance	304 949	136 502

which it is proposed to allocate as follows:

To the basic capital	30 500	13 700
To Disposable funds	274 449	122 802
	304 949	136 502

Notes to the accounts for the year ending 31 December 2006

The accounts have been prepared in compliance with the Norwegian Accounting Act and generally accepted Norwegian accounting practices for small businesses.

The enterprise is not required to have a service pension scheme under the Act relating to Obligatory Company Pensions since it has no employees.

Note 1 Bank deposit

Specification of bank deposit for the period ending 31 December 2006:

DnB NOR, account 8200.06.22903, balance	12 954 573	8 649 624
Total	12 954 573	8 649 624

Note 2 Basic capital

The Basic capital has increased by 10 per cent of the annual yield

Note 3 Disposable funds

The Centre for Advanced Study made NOK 4 000 000 available for allocation.

The amount was booked directly to disposable funds.

To the Board of the Operating Fund
Centre for Advanced Study

AUDITORS' REPORT FOR 2006

We have audited the Annual Accounts of the Centre for Advanced Study for 2006, which show a surplus of NOK 304 949. We have also audited the information in the Annual Report concerning the Annual Accounts, and going concern assumption. The Annual Accounts comprise income statement, balance sheet and notes. The Accounts have been prepared in conformity with the Accounting Act and good auditing practice. The Annual Account and the Annual Report have been submitted by the Board of the Operating Fund. Our responsibility is to express an opinion on the annual accounts and other matters in accordance with the requirements of the Auditors Act.

We have performed our audit in conformity with the law, regulations and good auditing practice in Norway and auditing standards adopted by the Norwegian Institute of Public Accountants. The auditing standards require that we plan and conduct the audit in order to achieve a satisfactory level of certainty that the annual accounts do not contain any material errors or omissions. The audit comprises an examination of selected parts of the evidence in support of the information in the annual accounts, an assessment of the accounting principles applied and of important accounting estimates, and an evaluation of the content and presentation of the annual accounts. To the extent required by generally accepted standards of good auditing, the audit also includes an examination of the Operating Fund's asset management and of its accounting and internal control systems. We believe that our audit provides a satisfactory basis for our statement.

We are of the opinion that

- the annual accounts have been presented in conformity with legislation and regulations and reflect the Operating Fund's financial situation on 31 December 2006 and its result for the financial year in accordance with good auditing practice in Norway.
- the management has fulfilled its duty to ensure orderly and clear registration and documentation of information relating to the accounts in conformity with legislation and good accounting practice in Norway.
- the information in the Annual Report concerning the going concern is consistent with the annual accounts and is in conformity with legislation and regulations.

Stabekk, 22 February 2007

NITSCHKE AS

Morten Hurum
State-authorized auditor



Group leaders 2006/2007: Professors Øystein Kravdal, Turid Karlsen Seim, Asle Sudbø, Arne Brataas and Nico Keilman.

Opening Ceremony 2006

The opening of the 15th academic year of the Centre for Advanced Study took place on the premises of the Norwegian Academy of Science and Letters, Drammensveien 78, on 5 September 2006.

The same evening the Centre hosted a welcome dinner for this year's fellows at CAS.

Professors Kristian Fosshem, NTNU and Jan Trulsen, UiO



Opening Ceremony 2006



Professor Kristian Fossheim, NTNU
and Liv Feder

Professor Asle Sudbø, NTNU, held the lecture: "Novel quantum fluid states in hydrogen". Here in conversation with Professor Aanund Hylland, UiO, Chairman of the Board at CAS.



From left: Professors Eivind Hiis Hauge, Arne Brataas and Kristian Fossheim, NTNU,
and Bjarne Rogan, UiO.



Reports from the research groups of 2005/2006

8 *Narrative Theory and Analysis*

Report by Jakob Lothe
Group leader 2005/2006

1 October, 2006

8.1 General description

A guiding premise for this research project has been that no human culture can emerge without defining itself by means of the telling of stories. We understand ourselves, our fellows, and our lives by incorporating them into narrative accounts. Investigations into various forms of narrative have contributed to the development of narrative theory. As this growing body of knowledge now plays an essential part in a wide range of academic disciplines, a significant part of the team's work has been interdisciplinary in its orientation. Thus, although the basis for the project was literary studies, we studied not only verbal but also filmic fictions as well as historical narratives.

Throughout our year at CAS, one main premise for the team's understanding and application of 'narrative theory' has been, and still is, that narrative theory and analysis are, and should be, closely interrelated. Although narrative analysis has sometimes been seen as a purely formalistic and technical activity, our work at CAS has been informed by the view that the way in which a narrative is structured and understood (by both its creator and its interpreter) has fundamental interpretative and moral significance.

The main questions and issues explored by the research team have been divided into two problem areas: first, analysis of modernist narrative, concentrating on the fiction of Joseph Conrad and Franz Kafka; second, explora-

tion of narrative by focusing on the relationship between fiction and history. Modernist fiction, and not least that of Conrad and Kafka, presents a particular challenge to the study of narrative: it is the product of the epistemic break at the turn of the twentieth century, which generated an aesthetic break and a problematization of realistic narrative premises. As regards the second problem area, we have concentrated on narrative representations of and responses to the Holocaust. Studying examples of both, the team has focused on the complex and shifting relationship between past and present selves as presented in first-person and third-person autobiographical and fictional Holocaust narratives.

As this general description indicates, all the team's work at CAS has been informed and aided by narrative theory. The insights, methodology and terminology associated with this body of theory have proved very useful. Moreover, our overall idea of linking narrative theory to analysis of the relevant texts also proved critically productive. This turned out to be a process that works two ways: on the one hand, the team's narrative analyses have been aided by narrative theory; on the other hand, the analyses carried out by team members also made it possible to criticise and refine constituent elements of narrative theory. A related characteristic feature of the team's work, which became increasingly apparent as the year progressed, was the critical fruitfulness of linking significant issues of both narrative theory and analysis to problems and questions observable in related disciplines such as philosophy, history, and studies of photography and film.

The main aim of the project was to produce three academic books: one on Conrad, one on Kafka, and one on narrative representations of the Holocaust. As far as the first two are concerned, an essential part of the work was linked to two international colloquia arranged at the Norwegian Academy of Science and Letters in September 2005 and May 2006. These events, presented under 3.1 and 3.2 below, constitute the basis for the first two books, entitled *Joseph Conrad: Voice, Sequence, History, Genre*, edited by Jakob Lothe, Jeremy Hawthorn, and James Phelan, and (provisionally) *Franz Kafka: Narrative, History, Genre*, edited by Jakob Lothe, Beatrice Sandberg, and Ronald Speirs. The book on narrative representations of the Holocaust, tentatively entitled *After Testimony: The Ethics and Aesthetics of Holocaust Narrative* and edited by Jakob Lothe, Susan Suleiman, and James Phelan, is based on seminars arranged at CAS during the project year; and it was also inspired by an excursion to Berlin in October 2005 (see 3.3 below). An additional

bonus deriving from the team's work is the book *Tidsvitner: Fortellinger fra Auschwitz og Sachsenhausen* (Time Witnesses: Narratives from Auschwitz and Sachsenhausen), edited by Jakob Lothe and Anette Storeide and published on 14 September 2006 by Gyldendal Norsk Forlag, Oslo.

8.2 Participants and research activities

The following researchers were involved in the project:

Professor Jakob Lothe, University of Oslo
Professor Beatrice Sandberg, University of Bergen
Professor Jeremy Hawthorn, Norwegian University of Science and Technology (NTNU)
Associate Professor Anniken Greve, University of Tromsø
Professor Daphna Erdinast-Vulcan, University of Haifa
Professor James Phelan, Ohio State University
Professor Susan Rubin Suleiman, Harvard University
Professor J. Hillis Miller, University of California, Irvine
PhD student Anette Storeide, University of Oslo
PhD student Anne Thelle, University of Oslo

Jakob Lothe (group leader) was at CAS for the entire academic year. In collaboration with the other team members, he organized the team's activities, including the two international colloquia and the excursion to Berlin. He is co-editor of the four books being generated by the project.

Beatrice Sandberg worked at CAS the whole year. An internationally recognized Kafka scholar, she co-organized the Kafka colloquium and made significant contributions to the team's work on the issues of history and narrative, and on autobiographical literature (including Holocaust literature) and its contribution to history. Sandberg is co-editor of the book on Kafka resulting from the Kafka colloquium, and she is a contributor to the Holocaust book.

Jeremy Hawthorn was at CAS the whole year. A pre-eminent Conrad scholar, Hawthorn co-organized the Conrad colloquium. Hawthorn's studies of the novel, modernism, and literary theory and terminology formed a significant part of the project's basis, and throughout the year he was a very active and inspiring participant. During the final months of the project period, Hawthorn,

in collaboration with Lothe and Phelan, completed the book on Conrad (see 3.1 below). In addition to his chapter of this book, he is also a contributor to the book on the Holocaust.

Anniken Greve completed and circulated original and promising work on narrative theory, on Franz Kafka, and on the testimony of Holocaust survivor Primo Levi. She spent the whole year at CAS. With her training in philosophy, Greve is theoretically strong, and her philosophical expertise proved very helpful and inspiring for the other team members. Greve was a speaker at the international Kafka colloquium; and she also gave two luncheon seminars during her year at CAS. One example of the team's continuing cooperation is that team member James Phelan, in response to an invitation from Greve, will visit the University of Tromsø in 2007 to give a seminar on narrative theory. Anniken Greve is a contributor to the Kafka book and to the book on the Holocaust.

Daphna Erdinast-Vulcan worked at CAS for most of the autumn term (September–mid-November) and the second half of the spring term (April–June). Erdinast-Vulcan was a very good fit for the team. In addition to her numerous contributions to our semi-formal and informal discussions, she delivered an excellent paper at the Conrad colloquium. She is also a contributor to the book on narrative representations of the Holocaust.

James Phelan was at CAS from September to mid-November in 2005, and then for two two-week periods in May and June 2006. As a leading narrative theorist, Phelan was active in all three areas of the project. Genuinely interested in and strongly committed to the team's work, he proved an excellent team member: critically constructive, appreciative of the views and contributions of others, and consistently result-oriented. Phelan gave papers at both the Conrad colloquium and the one on Kafka. A contributor to all three academic books, Phelan has completed his editorial work on the Conrad volume. In conjunction with Lothe and Suleiman, he is editing the volume on narrative representations of the Holocaust, *After Testimony: The Ethics and Aesthetics of Holocaust Narrative*.

Susan Rubin Suleiman spent the months of September 2005 and June 2006 at CAS. She made a very significant contribution to the team's work on narrative representations of the Holocaust. Thanks to Suleiman, it became possible to invite other leading Holocaust scholars to CAS, where we organized semi-

nars focusing on problems and critical challenges pertaining to the book on narrative representations of the Holocaust, *After Testimony: The Ethics and Aesthetics of Holocaust Narrative*. Suleiman will edit this book with Lothe and Phelan, and she is also the author of one of its chapters. Suleiman's commitment and expertise have been invaluable to the production of this book.

J. Hillis Miller spent three two-week periods at CAS in September 2005, May 2006 and June 2006. Immensely knowledgeable yet modest about his own achievements, and genuinely interested in the work of others, he fit perfectly into the research team and made very significant contributions to our work. Miller was a speaker at both the Conrad and the Kafka colloquia, and he is thus a contributor to both the books. He is also writing a chapter for the Holocaust book.

Anette Storeide was at CAS the whole year. In addition to contributing to the team's activities during the year, she completed (with Jakob Lothe as assistant supervisor) her PhD dissertation entitled *Das Schreiben über die KZ-Gefangenschaft: Eine Analyse von Zeugnissen Norwegischer Überlebender des Konzentrationslagers Sachsenhausen*. The dissertation was submitted to the Faculty of Arts, University of Oslo, in September 2006. Storeide is co-editor of *Tidsvitner: Fortellinger fra Auschwitz, og Sachsenhausen* (Time Witnesses: Narratives from Auschwitz and Sachsenhausen); and she is a contributor to *After Testimony*.

Anne Thelle spent the whole year at CAS. A contributor to the team's activities during the project year, she completed (with Jakob Lothe as assistant supervisor), her PhD dissertation entitled *Writing as Negotiation: A Narrative Analysis of Kakagami Kenji's 'Kiseki'*. The dissertation was submitted to the Faculty of Arts, University of Oslo, in August 2006. Thelle is also a contributor to *After Testimony*.

8.3 Colloquia, workshops and seminars

As indicated above, the team's work on Conrad and Kafka was structured around two international colloquia. The basic idea of both the events was to enable the team to meet and work together with a number of leading Conrad and Kafka scholars who have taken an interest in our project. Thus, the part of

the project dealing with modernist fiction served as the basis for both colloquia; and on each occasion both team members and invited scholars delivered papers. These papers constitute the basis for the two books, one of which has been completed.

8.3.1 *Conrad colloquium*

The colloquium on Conrad was arranged at the Norwegian Academy of Science and Letters, Drammensveien 78, Oslo, from 22 to 24 September 2005. The following papers were read:

Zdzisław Najder (Warsaw): The Personal Voice in Conrad's Fiction

Jeremy Hawthorn (Trondheim): Life Sentences: Linearity and its Discontents in Joseph Conrad's *A Outcast of the Islands*

Daphna Erdinast-Vulcan (Haifa): *Nostromo* and the Writing of History

Jakob Lothe (Oslo): Conrad's *Lord Jim*: Narrative and Genre

Christophe Robin (Lille): Time, History, and Narrative in *Nostromo*

Susan Jones (Oxford): 'Savage and Superb': Physical and Narrative Movement in *Heart of Darkness*

Josiane Paccaud-Huguet (Lyon): Motion that Stands Still: The Conradian Flash of Insight

James Phelan (Ohio): "I Affirm Nothing": *Lord Jim* and the Uses of Textual Recalcitrance

J. Hillis Miller (Irvine): "Material Interests": Modernist English Literature as Critique of Global Capitalism

Allan Simmons (St Mary's College): *The Nigger of the 'Narcissus'*: History, Narrative, and Nationalism

John Stape (Vancouver): Narrating Identity in *A Personal Record*

The colloquium was attended by all team members. All the papers were followed by discussion, and in several cases also by a 'respondent' who, having read a written version of the paper before it was delivered, commented on it and presented some criticisms of it. In addition to the speakers, CAS also invited other notable Conrad scholars to the colloquium. Attending all the sessions, these scholars contributed significantly to what became, in all delegates' assessments, a highly successful event. The papers formed the basis for a book entitled *Joseph Conrad: Voice, Sequence, History, Genre*, edited by Jakob Lothe, Jeremy Hawthorn, and James Phelan. Since one invited speaker could not come to Oslo, we asked an invited scholar who did not give a paper, Professor Gail Fincham of the University of Cape Town, to write a chapter on Conrad's *Under Western Eyes* for the volume. This essay, entitled 'Conrad's Western Eyes', is a valuable and relevant contribution to the Conrad book. See also 4. below.

8.3.2 *Kafka colloquium*

The colloquium on Franz Kafka was arranged at The Norwegian Academy of Science and Letters, Drammensveien 78, Oslo, from 4 to 6 May 2006. The following papers were read:

Gerhard Neumann (Munich): The Deserted Desk: On Kafka's Metanarrative, with Particular Reference to the Story 'Der Heizer'

Anniken Greve (Tromsø): The Human Body and the Human Being in 'Die Verwandlung'

Stanley Corngold (Princeton): The Music of Narration in 'Forschungen eines Hundes'

Beatrice Sandberg (Bergen): Kafka's Ingresses and the Following Sentences: The Gap Between Narrative Form and Content

Jakob Lothe (Oslo): Titles and Beginnings: Kafka's 'In der Strafkolonie', compared with J. M. Coetzee's *Waiting for the Barbarians*

Jim Phelan (Ohio): Progression and Judgment in Kafka's 'Das Urteil'

Ronald Speirs (Birmingham): Movement and Narration in Kafka's Writing

Moritz Schramm (Copenhagen): Individuality as Narrative: The Concept of Self-Development in Kafka's Fragments and Letters

Benno Wagner (Siegen): 'No Lightning Flashes Any Longer': Kafka's Chinese Voice and the Thunder of the Great War

J. Hillis Miller (Irvine): K. Enisled and the Impossibility of Verification

Gerhard Kurz (Giessen): *Der Verschollene*: Therese's Narration

Also at this colloquium, all papers were followed by discussion. In addition to the speakers and almost all team members, participants included some invited experts on modernism and on Kafka. The critical calibre of the papers was very high. They form an excellent basis for a book, tentatively entitled *Franz Kafka: Narrative, History, Genre*, which will be co-edited by Jakob Lothe and Beatrice Sandberg. See also 4. below.

8.3.3 Excursion to Berlin, October 2005

To improve the team's knowledge of the Nazi concentration camps and the Holocaust (the event constituting the historical reference point of the narratives studied in *After Testimony: The Ethics and Aesthetics of Holocaust Narrative*), most of the team members spent five days in Berlin in the latter half of October 2005. This visit proved very inspiring, useful and relevant to our work. Our activities included a visit to the recently opened Holocaust Memorial next to the Brandenburger Tor, a one-day trip to the Sachsenhausen concentration camp (led by Anette Storeide, who has worked there as a guide and is intimately familiar with the history of the camp), and visits to the Jewish Museum and the Jewish synagogue.

A huge bonus of our trip was an afternoon seminar specially organized by Professor Irene Kacandes (Dartmouth College, USA). This seminar allowed us to meet with experts on various aspects of the Holocaust, discussing the problem of how this vexed issue can, or should, be represented. One of the Holocaust scholars we met in here, Dr Wolf Kaiser of the Wannsee-Konferenz, visited our team at CAS in June 2006.

8.3.4 *Tuesday and Thursday seminars, film screenings*

Profiting from the presence and organizing talent of Susan Suleiman, we arranged a seminar on narrative representations of the Holocaust in September 2005. The discussions at these seminars, to which all team members contributed, were aided by the lectures and comments given by Professor Irene Kacandes of Dartmouth College. The seminars ended with a discussion of how to organize the team's work on the Holocaust book.

In June 2006, this seminar series was repeated and extended. Here, too, all team members attended the seminar, which was also visited by distinguished Holocaust scholars including Wolf Kaiser (Wannsee-Konferenz, Berlin), Marianne Hirsch (Columbia University), Janet Walker (University of California, Santa Barbara), and Irene Kacandes (Dartmouth College). As in September 2005, the focus of these seminars was on the Holocaust book, but now we were able to draw on and profit from our work on the issue from October 2005 to May 2006. In addition to all team members, Marianne Hirsch, Janet Walker and Irene Kacandes will contribute to *After Testimony*, as will several other noted Holocaust scholars, including Sidra Ezrahi and Michael Rothberg.

In addition to these two seminar series, a number of working seminars were arranged in the course of the year at CAS. On Tuesdays, team members often met to discuss selected problems of narrative and narrative theory. On Thursday afternoons, a number of seminars were arranged at which invited guests presented relevant aspects of their recent work to the team members. The presentations were typically followed by questions and discussion. Invited guests who addressed the team in this critically constructive manner included Professor Dag Anderson (University of Tromsø), Professor Jan-Olav Henriksen (Norwegian Lutheran College), Professor Arne Johan Vetlesen (University of Oslo), Professor Irene Levin (Oslo University College), Associate Professor Ingrid Nielsen (University of Bergen), and PhD student Kyrre Kverndokk (University of Oslo).

On Friday, 10 March, we arranged a one-day seminar in collaboration with Professor Arne Melberg, the leader of the research team 'Aesthetics at Work' at the University of Oslo. The critical focus of this seminar was on the use of illustrations and photographs in fictional texts. On Saturday, 25 March, we arranged another one-day seminar at CAS. There, the team members presented

drafts of their contributions to the Holocaust book, and each draft paper was then the subject of discussion. All team members contributed to the 'Luncheon Seminar' series at CAS 2005–06.

8.4 Achievements and evaluation

The team launched its year of collaborative efforts with a very successful colloquium that brought together experts on both narrative theory and the fiction of Joseph Conrad. This event managed to bring together some of the most respected Conradian scholars from three continents and many countries, and was characterized by a succession of original papers and some very lively discussion. There is no doubt that the final form of each of the twelve essays that constitute the bulk of the Conrad book owes much to the feedback the authors received during and after the colloquium.

Producing a collection of essays on a common theme and having three editors can be a risky business, but in this case the collaboration between the editors could serve as a role model for what such collaborative editorship can achieve. All three editors commented on each essay submitted, but their comments were transmitted to each contributor in the form of an integrated set (and often series) of comments so as to avoid confusing the contributor with three sets of comments. To achieve this, one of the three editors had the job of distilling points from reports written by all three editors, and synthesizing the distillations into a single report (and often a series of such single reports):

This model of collaborative work based on dialogue and exchange can serve as a model of how the team as a whole has worked on all three parts of the project. The physical set-up at CAS, featuring adjoining rooms and common spaces, has proved an invaluable asset to our work. Lunchtime meetings with the two other teams and regular Wednesday seminars were also most enjoyable and thought-provoking, leaving all of us feeling that Wednesdays will never be the same again, after having looked forward to them with such great anticipation during their year at CAS.

In such a report, it would be easy to skip things that were not a problem during our year at CAS, but like the dog that did not bark in the Sherlock Holmes story, these too should be mentioned. We all had comfortable offices and very good accommodations, allowing long discussions to take place at

the Centre and they could, if necessary, continue at home. Problems were dealt with immediately by the CAS staff. We had excellent support from the technical staff (computers, video/DVD projectors, etc.). No one had to wait for remuneration for expenses or for queries to be answered. In other words, the sorts of irritation that all too often affect us in our everyday working lives, i.e. irritation that can interrupt a train of thought or a discussion, was almost completely absent. Behind this absence of problems lies, we know, a lot of hard work on the part of the CAS staff and a decidedly proactive approach to possible difficulties.

While the Conrad book has been completed, the team's work on the Kafka book and on *After Testimony* continues. The speakers at the Kafka conference in May 2005 will submit revised versions of their papers by the end of this year; and Lothe, Sandberg and Speirs expect to finish editing the book in the early half of 2007. As far as *After Testimony* is concerned, the editors (Lothe, Suleiman, and Phelan) have now received the abstracts of all the chapters, and we plan to submit a book proposal to major publisher next month.

As our work on the Kafka and Holocaust books indicates, the team members continue to collaborate in spite of being back at their respective universities. This kind of continuing cooperation has been made possible by the inspiring and productive year we spent at CAS. In November, the Norwegian team members plan to meet for a one-day seminar in order to further discuss their contributions to *After Testimony*, and in late June 2007, we are planning a final seminar on this book. At that seminar, which will be arranged in Berlin, all contributors will present the final versions of their papers/chapters, which will then be discussed and criticized to maximize the critical coherence and interest engendered by the volume. As regards possible further cooperation, most of the team members are interested in joining a Nordic network (currently being set up) in narrative theory.

To sum up, of the three main books, the work on Conrad has been completed, while a very substantial amount of work has been done on the other two. As indicated above, *Tidsvitner* (Time Witnesses) was published on 14 September 2006. The book was launched at the HL-Centre at Villa Grande, Bygdøy, and most of the time witnesses whose narratives constitute the book's eight chapters were present at the launch. The media showed very considerable interest: the book was presented on four different TV programmes including *Dagsrevyen* (Daily News), on Norwegian radio, and as a five-page feature

article in the weekly newspaper supplement *Dagbladet Magasinet*. The book is selling very well and is already being reprinted. The focus of the media has consistently been on the time witnesses and their stories, which is exactly as it should be. *Tidsvitner* (Time Witnesses) could not and would not have been produced without the support of the team members and the director of CAS.

All members of the team felt deeply privileged to be able to work at CAS for an extended period of time. We have nothing but praise both for the centre and its excellent administration.

8.5 Publications

As indicated above, one essential aim of the project team has been to publish three academic books on the topics presented above. A significant bonus of the team's work, *Tidsvitner* is described briefly under chapter 4 above. In addition to these four books, all of which are the result of the team's work at CAS during the project year, the team members have also published a number of books and articles which are closely associated with the main publications, partly by forming a significant part of the basis for the three academic books and partly by profiting from our work on them. The following list includes work produced by all team members. Most of the titles are either published in 2005–06 or forthcoming; we have also included a few earlier publications which have proved particularly important for the team's work.

8.5.1 *Published books and articles*

Erdinast-Vulcan, Daphna. "Some Millennial Footnotes on Heart of Darkness." In *Conrad for the Twenty-First Century*, edited by Carola Caplan, Peter Mallios and Andrea White. London: Routledge, 2005, 55–65.

Erdinast-Vulcan, Daphna. "'Things Pregnant With Words': What Todorov Learned from Bakhtin." *Canadian Review of Comparative Literature*, 2006.

Hawthorn, Jeremy. "Theories of the Gaze." In *Literary Theory and Criticism*, edited by Patricia Waugh. Oxford: Oxford University Press, 2006, 508–518.

- Hawthorn, Jeremy. "Reading and Writhing: The Exotic and the Erotic in Joseph Conrad's *An Outcast of the Islands*." In *Postcolonial Dislocations: Travel, History, and the Ironies of Narrative*, edited by Charles Armstrong and Øyunn Hestetun Oslo: Novus Forlag, 2006, 227–239.
- Hawthorn, Jeremy. "Artful Dodges in Mental Territory: Self-Deception in Conrad's Fiction." *Conradiana*, 37(3), Fall 2005, 205–231.
- Hawthorn, Jeremy. "The Use of 'Coon' in Conrad: British Slang or Racist Slur?" *The Conradian* 30(1), 2005, 111–117.
- Hawthorn, Jeremy. "Death and the Image: Photography, the Gaze, and the Limits of Realism." In *Against the Grain / Gegen den Strich gelesen*, edited by Peter Drexler and Rainer Schoor. Potsdam: Trafo 2005, 161–179.
- Hawthorn, Jeremy. *Studying the Novel*. Fifth Edition. London: Arnold, 2005.
- Lothe, Jakob. "Narrative, Identity, Solidarity: Conrad's *Heart of Darkness* and *Lord Jim*." In *Conrad's Europe*, edited by Andrzej Ciuk and Marcin Piechota. Opole: University of Opole, 2005, 139–151.
- Lothe, Jakob. "Narrative and Memory in J.M. Coetzee's *Boyhood*." In *Postcolonial Dislocations: Travel, History, and the Ironies of Narrative*, edited by Charles Armstrong and Øyunn Hestetun. Oslo: Novus Forlag, 2006, 187–200.
- Lothe, Jakob. "Narrative Vision in *Middlemarch*: The Novel Compared with the BBC Adaptation." In "*Middlemarch*" in the *Twenty-First Century*, edited by Karen Chase. Oxford: Oxford University Press, 2006.
- Lothe, Jakob. *Tidsvitner: Fortellinger fra Auschwitz og Sachsenhausen* (Time Witnesses: Narratives from Auschwitz and Sachsenhausen), edited with Anette Storeide. Oslo: Gyldendal, 2006.
- Lothe, Jakob. "Innledning" (Introduction). In *Tidsvitner: Fortellinger fra Auschwitz og Sachsenhausen* (Time Witnesses: Narratives from Auschwitz and Sachsenhausen), edited with Anette Storeide. Oslo: Gyldendal, 2006, 9–29.
- Miller, J. Hillis. *Speech Acts in Literature*. Stanford: Stanford University Press, 2002.
- Miller, J. Hillis. *J. Hillis Miller: A Reader*. Edinburgh: Edinburgh University Press/Stanford: Stanford University Press, 2005.
- Miller, J. Hillis. *Literature as Conduct: Speech Acts in Henry James*. New York: Fordham University Press, 2005.

Phelan, James. *Living to Tell about It: A Rhetoric and Ethics of Character Narration*. Ithaca: Cornell University Press, 2005.

Phelan, James. *A Companion to Narrative Theory*, edited with Peter J. Rabinowitz. Oxford: Blackwell Publishing, 2005.

Phelan, James and Peter J. Rabinowitz. "Introduction." In *A Companion to Narrative Theory*. Edited with Peter J. Rabinowitz. Oxford: Blackwell Publishing, 2005, 1–16.

Phelan, James. *The Nature of Narrative: Fortieth Anniversary Edition*. New York: Oxford University Press, 2006. With Robert Scholes and Robert Kellogg. Phelan's contribution is a new, final chapter on "Narrative Theory, 1966–2006: A Narrative" plus an extensive bibliography.

Phelan, James. Editor of *Narrative* and co-editor of the *Theory and Interpretation of Narrative* book series published by Ohio State University Press.

Sandberg, Beatrice. *Autobiographisches Schreiben in der deutschsprachigen Gegenwartsliteratur, Bd. 1: Identität und Fiktionalität*, edited with Ulrich Breuer. München: Iudicium Verlag, 2006.

Sandberg, Beatrice and Ulrich Breuer. "Einleitung." In *Autobiographisches Schreiben in der deutschsprachigen Gegenwartsliteratur, Bd. 1: Identität und Fiktionalität*, edited with Ulrich Breuer. München: Iudicium Verlag, 2006, 9–16.

Sandberg, Beatrice. "Schreibende Söhne. Neue Vaterbücher aus der Schweiz." In *Autobiographisches Schreiben in der deutschsprachigen Gegenwartsliteratur, Bd. 1: Identität und Fiktionalität*, edited with Ulrich Breuer. München: Iudicium Verlag, 2006, 156–171.

Sandberg, Beatrice. "Schweizer Literatur – ein Phantom in den Köpfen von Germanisten?" In *Eine Insel im vereinten Europa? Situation und Perspektiven der Literatur der deutschen Schweiz*, edited by Hernandez and O. Marti-Pena. Berlin: Weidler Buchverlag, 2006, 11–23.

Storeide, Anette. *Tidsvitner: Fortellinger fra Auschwitz og Sachsenhausen* (Time Witnesses: Narratives from Auschwitz and Sachsenhausen), edited with Jakob Lothe. Oslo: Gyldendal, 2006.

Storeide, Anette. "Innledning" (Introduction). In *Tidsvitner: Fortellinger fra Auschwitz og Sachsenhausen* (Time Witnesses: Narratives from Auschwitz and Sachsenhausen), edited with Jakob Lothe. Oslo: Gyldendal, 2006, 9–29.

Storeide, Anette, "Überlebende des Konzentrationslagers Sachsenhausen in der norwegischen Erinnerungskultur." In *Lagersystem und Repräsentation: Interdisziplinäre Studien zur Geschichte der Konzentrationslager*, edited by Ralph Gabriel et al. Tübingen, 2004.

Suleiman, Susan Rubin. *Crises of Memory and the Second World War*. Cambridge, MA: Harvard University Press, 2006.

Suleiman, Susan Rubin. *Contemporary Jewish Writing in Hungary: An Anthology*. Edited with Eva Forgacs. Lincoln, NE: University of Nebraska Press, 2003.

Suleiman, Susan Rubin. "The 1.5 Generation: Georges Perec's *W or the Memory of Childhood*." In *Teaching the Representation of the Holocaust*, edited by Marianne Hirsch and Irene Kacandes. New York: The Modern Language Association of America, 2004, 372–385.

Suleiman, Susan Rubin. "Historical Trauma and Literary Testimony: Writing and Repetition in the Buchenwald Memoirs of Jorge Semprun." *Journal of Romance Studies*, 4:2 (2004), 1–19.

Suleiman, Susan Rubin. "Culture, Aestheticism and Ethics: Sontag and the Idea of Europe." *PMLA*, 120:3 (2005), 839–842.

8.5.2 Forthcoming publications

Erdinast-Vulcan, Daphna. "Nostromo and the Writing of History." Accepted for publication in *Joseph Conrad: Voice, Sequence, History, Genre*, edited by Jakob Lothe, Jeremy Hawthorn, and James Phelan. Volume under consideration by Ohio State University Press.

Erdinast-Vulcan, Daphna. "Traduttore/traditore: Translation, Exile and Betrayal in Conrad's *Lord Jim*." In *Conrad: l'écrivain et l'étrangeté de la langue*, edited by Josiane Paccaud-Huguet. Paris: Minard, forthcoming.

Erdinast-Vulcan, Daphna. "'Part of My Flesh': The Subversive Jewish Voice of Nissim Ezekiel." In *Remembering Nissim Ezekiel*. New Delhi: The Indian Academy, forthcoming.

Erdinast-Vulcan, Daphna. "Language, Exile, and Subjectivity." Scheduled for publication in *Studies in the Philosophy of Education*.

Erdinast-Vulcan, Daphna. *Bakhtin and the Question of the Subject: Merleau-Ponty and the Language of Literature*. Book project in progress.

Greve, Anniken. *Litteraturens meddelelse: En litteraturvitenskapelig tolkningmetodikk i teoretisk, praktisk og skeptisk lys* (The message of literature: A literary methodology of interpretation seen in a theoretical, practical and sceptical light). Dr. philos. dissertation to be submitted to the University of Tromsø in October 2006.

Greve, Anniken. "The Reader of Literature: In Need of a Theory or a Method?"
Forthcoming.

Greve, Anniken. "The Human Body and the Human Being in 'Die Verwandlung.'" Accepted for publication in *Franz Kafka: Narrative, History, Genre*, edited by Jakob Lothe, Beatrice Sandberg, and Ronald Speirs. In progress.

Greve, Anniken. "The Life of a Document in the Narrative of a Life: Story Progression, Contextualization and Historical Awareness in Espen Søbye's *Kathe: Alltid vært i Norge*." Accepted for publication in *After Testimony: The Ethics and Aesthetics of Holocaust Narrative*, edited by Jakob Lothe, Susan Suleiman, and James Phelan. In progress.

Hawthorn, Jeremy. *Sexuality and the Erotic in the Fiction of Joseph Conrad*. Typescript completed and accepted for publication by Continuum International. Publication scheduled for March 2007.

Hawthorn, Jeremy. *Joseph Conrad: Voice, Sequence, History, Genre*, edited by Jakob Lothe, Jeremy Hawthorn, and James Phelan. Volume under consideration by Ohio State University Press.

Hawthorn, Jeremy. "Life Sentences: Linearity and its Discontents in Joseph Conrad's *An Outcast of the Islands*." Accepted for publication in *Joseph Conrad: Voice, Sequence, History, Genre*, edited by Jakob Lothe, Jeremy Hawthorn, and James Phelan. Volume under consideration by Ohio State University Press.

Hawthorn, Jeremy. "Human Encounters in Holocaust Testimonies." Accepted for publication in *After Testimony: The Ethics and Aesthetics of Holocaust Narrative*, edited by Jakob Lothe, Susan Suleiman, and James Phelan. In progress.

Hawthorn, Jeremy. "Joseph Conrad's Half-finished Fictions." Accepted for *The Cambridge Companion to the Modernist Novel*, edited by Morag Schiach. Publication autumn 2007.

Hawthorn, Jeremy. "'The right word': The Individual Appropriation of Language in Joseph Conrad's *Under Western Eyes*." In *Conrad: l'écrivain et l'étrangeté de la langue*, edited by Josiane Paccaud-Huguet. Paris: Minard, forthcoming.

Hawthorn, Jeremy. "Authorial Deaths: Real and Metaphorical." Accepted for publication in a collection edited by Stephen Donovan to be published by Rodopi.

Hawthorn, Jeremy. "Travel as Incarceration: Jean Rhys's *After Leaving Mr Mackenzie*." Accepted for publication in a volume provisionally entitled *A Short History of Space*, edited by Attie de Lange, Gail Fincham, Jakob Lothe, and Jeremy Hawthorn. Volume under consideration by Palgrave.

Lothe, Jakob. *Joseph Conrad: Voice, Sequence, History, Genre*, edited by Jakob Lothe, Jeremy Hawthorn, and James Phelan. Volume under consideration by Ohio State University Press.

Lothe, Jakob. "Conrad's *Lord Jim*: Narrative and Genre." Accepted for publication in *Joseph Conrad: Voice, Sequence, History, Genre*, edited by Jakob Lothe, Jeremy Hawthorn, and James Phelan. Volume under consideration by Ohio State University Press.

Lothe, Jakob. *Franz Kafka: Narrative, History, Genre*, edited by Jakob Lothe, Beatrice Sandberg, and Ronald Speirs. In progress.

Lothe, Jakob. "Titles and Beginnings: Kafka's 'In der Strafkolonie' Compared to J. M. Coetzee's *Waiting for the Barbarians*." Accepted for publication in *Franz Kafka: Narrative, History, Genre*, edited by Jakob Lothe, Beatrice Sandberg, and Ronald Speirs. In progress.

Lothe, Jakob. *After Testimony: The Ethics and Aesthetics of Holocaust Narrative*, edited by Jakob Lothe, Susan Suleiman, and James Phelan. In progress.

Lothe, Jakob. "Narrative, History, Genre: W.G. Sebald." Accepted for publication in *After Testimony: The Ethics and Aesthetics of Holocaust Narrative*, edited by Jakob Lothe, Susan Suleiman, and James Phelan. In progress.

Lothe, Jakob. *Comparing European Modernisms*, edited by Mats Jansson, Hannu Riikonen, and Jakob Lothe. Helsinki: University of Helsinki Press. Forthcoming 2007.

Lothe, Jakob. "Narrative, Genre, Memory: The Title of W.G. Sebald's Novel *Austerlitz*." Accepted for publication in *Comparing European Modernisms*, edited by Mats Jansson, Hannu Riikonen, and Jakob Lothe. Helsinki: University of Helsinki Press. Forthcoming 2007.

Lothe, Jakob. *Litteraturvitenskapelig leksikon* (Dictionary of Literary Terms). Second edition. With Christian Refsum and Unni Solberg. Oslo: Kunnskapsforlaget. Forthcoming 2007.

Miller, J. Hillis. "Material Interests: Modernist English Literature as Critique of Global Capitalism." Accepted for publication in *Joseph Conrad: Voice, Sequence, History, Genre*, edited by Jakob Lothe, Jeremy Hawthorn, and James Phelan. Volume under consideration by Ohio State University Press.

Miller, J. Hillis. "K. Enslaved and the Impossibility of Verification." Accepted for publication in *Franz Kafka: Narrative, History, Genre*, edited by Jakob Lothe, Beatrice Sandberg, and Ronald Speirs. In progress.

Miller, J. Hillis. Contribution to *After Testimony: The Ethics and Aesthetics of Holocaust Narrative*, edited by Jakob Lothe, Susan Suleiman, and James Phelan. In progress.

Miller, J. Hillis. *Communities in Literature*. Forthcoming, Fordham University Press.

Miller, J. Hillis. *Derrida Without Condition*. Forthcoming.

Phelan, James. *Experiencing Fiction: Judgments, Progressions, and the Rhetorical Theory of Narrative*. Columbus: Ohio State University Press. In press.

Phelan, James. "What's at Stake in Narrative Theory? Contested Concepts, Rhetorical Solutions." With Peter J. Rabinowitz. In progress.

Phelan, James. *Joseph Conrad: Voice, Sequence, History, Genre*, edited by Jakob Lothe, Jeremy Hawthorn, and James Phelan. Volume under consideration by Ohio State University Press.

Phelan, James. "Lord Jim and the Uses of Textual Recalcitrance." Accepted for publication in *Joseph Conrad: Voice, Sequence, History, Genre*, edited by Jakob Lothe, Jeremy Hawthorn, and James Phelan. Volume under consideration by Ohio State University Press.

Phelan, James. Progression and Judgment in Kafka's "Das Urteil." Accepted for publication in *Franz Kafka: Narrative, History, Genre*, edited by Jakob Lothe, Beatrice Sandberg, and Ronald Speirs. In progress.

Phelan, James. *After Testimony: The Ethics and Aesthetics of Holocaust Narrative*, edited by Jakob Lothe, Susan Suleiman, and James Phelan. In progress.

Phelan, James. Contribution to *After Testimony: The Ethics and Aesthetics of Holocaust Narrative*, edited by Jakob Lothe, Susan Suleiman, and James Phelan. In progress.

Sandberg, Beatrice. *Franz Kafka: Narrative, History, Genre*, edited by Jakob Lothe, Beatrice Sandberg and Ronald Speirs. In progress.

Sandberg, Beatrice. "Kafka's Ingresses and the Following Sentences: The Gap Between Narrative Form and Content." Accepted for publication in *Franz Kafka: Narrative, History, Genre*, edited by Jakob Lothe, Beatrice Sandberg, and Ronald Speirs. In progress.

Sandberg, Beatrice. "The Changing Narrative Strategies Used by Jewish-German Writers Since 1990." Accepted for publication in *After Testimony: The Ethics and Aesthetics of Holocaust Narrative*, edited by Jakob Lothe, Susan Suleiman, and James Phelan. In progress.

Sandberg, Beatrice, "Moderne, Postmoderne – und was weiter?" In *Osloer Beiträge zur Germanistik*, 2006, 186–96. In press.

Sandberg, Beatrice. "Nikolaj Frobenius *Teori og Praxis* und Dag Solstads Romanprojekt 16.07.41 im Kontext des autobiographischen Schreibens." In press.

Sandberg, Beatrice. "Erinnerung zwischen Authentizität und Fiktionalität. Holocaust-Hintergrund bei Fred Wander und Geschichte der Trennungen bei Jürgen Becker." 3. NordForsk-Conference, proceedings to be published by Iudicium, München.

Storeide, Anette. *Das Schreiben über die KZ-Gefangenschaft: Eine Analyse von Zeugnissen norwegischer Überlebender des Konzentrationslagers Sachsenhausen*. PhD dissertation submitted to the Faculty of Arts, University of Oslo, September 2006.

Storeide, Anette. "Which Narrative of Auschwitz or A Narrative of Auschwitz?" Accepted for publication in *After Testimony: The Ethics and Aesthetics of Holocaust Narrative*, edited by Jakob Lothe, Susan Suleiman, and James Phelan. In progress.

Storeide, Anette. "'Das Lager ist eine Welt für sich': Topographie der Erinnerung norwegischer KZ-Überlebender." In *Erinnerung und Topographie*. Forthcoming, Warszawa 2006.

Storeide, Anette. "The Transformation of Memories: The Witness as a Survivor and as a Suffering Witness." In *Witness and the Media of Representation*. Forthcoming, Copenhagen 2007.

Suleiman, Susan Rubin. *After Testimony: The Ethics and Aesthetics of Holocaust Narrative*, edited by Jakob Lothe, Susan Suleiman, and James Phelan. In progress.

Suleiman, Susan Rubin. Contribution to *After Testimony: The Ethics and Aesthetics of Holocaust Narrative*, edited by Jakob Lothe, Susan Suleiman, and James Phelan. In progress.

Suleiman, Susan Rubin. *Sartre and His Others/Sartre et Ses Autres*, special double issue, *Journal of Romance Studies*, 2006, edited with Sara Kippur. Forthcoming 2006.

Suleiman, Susan Rubin. "Oneself as Another': Identification and Mourning in Patrick Modiano's *Dora Bruder*." Forthcoming.

Thelle, Anne. *Writing as Negotiation: A Narrative Analysis of Kakagami Kenji's "Kiseki"*. PhD dissertation submitted to the Faculty of Arts, University of Oslo, August 2006.

Thelle, Anne. "In the Shadows of the Atomic Holocaust: Japan's Wartime Memories." Accepted for publication in *After Testimony: The Ethics and Aesthetics of Holocaust Narrative*, edited by Jakob Lothe, Susan Suleiman, and James Phelan. In progress.

9. *Environmental Economics: Policy Instruments, Technology Development and International Cooperation*

Report by Michael Hoel
Group leader 2005/2006

1 October, 2006

9.1 Project description

During the past three decades, a vast body of literature has been produced on environmental economics. A very broad and crude classification of this literature would divide it into two categories: *environmental regulation* and *valuation of environmental goods*. The present research project focused on the first category. In particular, the project concentrated on the following comprehensive and to some extent overlapping themes (although not all the work fits into any of these categories):

- A. International environmental/climate agreements
- B. Endogenous technology development
- C. Dynamics and time consistency
- D. Limited rationality, altruism, and social interdependency of preferences

Additional research covered issues such as biodiversity, conservation, inter-jurisdictional competition for mobile foreign direct investment based on environmental standards, and economic-geography issues such as the geographical concentration of pollution due to the agglomeration of economic activities.

A. *International environmental/climate agreements*

Several important environmental problems have a transboundary dimension, i.e. the environment in one country depends on emissions produced in other countries. For transboundary environmental problems, a socially optimal outcome requires some kind of coordination between countries, as emissions will otherwise be excessive. One possibility is to have an agreement that focuses directly on the emission levels of each country. A second type

of agreement would focus on the environmental policies in each country, e.g. emission taxes. One important feature of transboundary environmental problems is that there are very limited enforcement mechanisms at the international level. International environmental agreements must therefore be designed so that as many countries as possible choose voluntarily to accede to them. This feature implies that the optimal design of an agreement may be very different from what the design of the agreement would be if the group of cooperating countries were given on an exogenous basis. Gaining a far better understanding of the alternatives to a Kyoto-type climate agreement was one important area in the project. Particular emphasis was attached to how incentives for technology development could be affected by the design of an agreement.

B Endogenous technology development

One salient factor that affects economic growth refers to changes in technology. The technology changes and the accompanying economic growth will both impact the environment. A good understanding of what determines technological changes is therefore important for analysing the environmental impacts of economic activity. Moreover, some elements of technological change may be directly affected by the policy instruments used to control environmental performance. This is particularly true for those elements of technology changes that affect abatement costs for a given economic activity. The success of a policy may depend on the nature of the process of technological change and the imperfections in this process. Technological advances can occur through R&D investments as well as through learning during the production process and the use of technology. The benefits of these advances may accrue only to the innovating company or they may 'spill over' to others, in which case the innovator may not be able to capture all the additional benefits.

Another important issue is how different types of international agreements perform when there is endogenous technological change and technology spillovers between countries. The project studied the following types of questions: How do different policy instruments affect technology spillovers between companies in the same country, and between companies in different countries? What is the relationship between policy instruments of different countries, firm incentives to undertake R&D investments and the rate of technological diffusion? How is the rate of technological diffusion related to

different types of international climate agreements? What is the impact of the Clean Development Mechanisms on R&D investments among the signatories and what is the rate of technology diffusion?

C. *Dynamics and time consistency*

Most important environmental problems embrace a dynamic element: It is often not current emissions that affect the environment, but a stock of pollutants that gradually increases due to emissions. For some environmental problems, e.g. the climate, this dynamic dimension is of crucial importance, since the change in the volume of greenhouse gases in the atmosphere changes only slowly in response to current emissions. Climate development over the next 30 to 50 years is more or less already given by historical emissions. This implies that actions taken today to reduce emissions can only have a significant impact on the climate in the second half of this century and later. Clearly, a good understanding of how to balance present costs and benefits against future costs and benefits is crucial for the design of an efficient climate policy. Although there has been a large amount of research on this issue, there are still some issues that need further analysis. A second aspect of dynamics is the design of climate policy to achieve a goal of atmospheric concentration of greenhouse gases in a future year (e.g. 2100). Several different time paths of emissions can achieve the same goal, and it is not obvious what policy achieves the goal at the lowest cost. One reason why this is a difficult issue is that there are large uncertainties regarding future costs and benefits, and also the fact that technology development may be affected by the policy chosen.

D. *Limited rationality, altruism, and social interdependency of preferences*

Most economic models assume that individuals have an almost unlimited capacity to solve complex optimisation problems, that they are mainly concerned about their own access to goods and services, and that individual preferences are independent of others' preferences or actions. These assumptions are clearly stylized, and behavioural economists have studied the effects of relaxing such assumptions in economic analyses. Although environmental economists have to some extent integrated ideas from behavioural economics in their work, many interesting questions remain unanswered. For example, what determines the evolution and stability of social norms for environment-friendly behaviour, and how do such norms interact with environmental taxes

and/or other policy instruments? While providing good answers to such questions will obviously require interaction with researchers from disciplines other than economics, the integration of behavioural and environmental economics currently appears to be a promising field for research.

9.2 Participants

The following researchers participated in the project and spent more than a week at CAS (most of them several months):

- Kjell Arne Brekke, Ragnar Frisch Centre for Economic Research
- Johan Eyckmans, Katholieke Universiteit Leuven
- Carolyn Fischer, Resources for the Future
- Reyer Gerlagh, Vrije Universiteit Amsterdam
- Rolf Golombek, Ragnar Frisch Centre for Economic Research
- Cathrine Hagem, University of Oslo
- Tom-Reiel Heggedal, Statistics Norway
- Richard Howarth, Dartmouth College
- Snorre Kverndokk, Ragnar Frisch Centre for Economic Research
- Matti Liski, Helsinki School of Economics
- Karine Nyborg, Ragnar Frisch Centre for Economic Research
- Michael Rauscher, University of Rostock
- Thomas Sterner, University of Gothenburg
- Cees Withagen, Tilburg University
- Aart de Zeeuw, Tilburg University
- Michael Hoel, University of Oslo (group leader)

In addition, there were about five researchers who visited for up to a week.

9.3 Workshops

The project group arranged two workshops during the CAS period (in addition to several small seminars/workshops at the CAS premises).

The first workshop was in Oslo in September 2005. Almost all the entire project group took part in this workshop, as did several other participants (mostly Norwegian). The total number of participants was 24. The 12

presentations made at the workshop covered all the themes of the project. Presentations were given by CAS participants, while the subsequent discussions elicited contributions from the CAS participants and others. The presentations were typically on work that the researchers had embarked upon and planned to continue during their stay at CAS.

The second workshop was a small informal one organised at Beitostølen in February 2006. Only some (8 altogether) of the CAS researchers participated in this workshop. It covered the same themes as the Oslo workshop, and included 10 presentations. The presentations were, in this case, works in progress, and there was a lot of time allocated for discussions of each presentation.

We are currently planning another follow-up workshop in August 2007. It will be held at a venue near Oslo and will last for two full days, 30–31 August. All CAS participants will be invited, as will approximately an equal number of others. All in all, we expect about 30 participants. The CAS researchers will present the work they have been doing since arriving at CAS, especially work initiated during the CAS period. Non-CAS participants will be invited to be discussants.

9.4 Results

The scientific output from this project has been presented in a number of publications, cf. the list at the end of this report. Some of these publications were largely completed already before the CAS period started. For about 20 papers, a significant part of the work was done during the CAS period. Most of these publications are either in the review process or will be sent to international journals in the near future, although some have been already been published in or accepted by international journals.

Most of the work constitutes contributions to a large specialized body of literature on the topics studied. Accordingly, several of the results are can not be explained easily without an extensive summary of the relevant literature. The results from a selection of work in each of the four main themes are given below.

A. *International environmental/climate agreements*

The clean development mechanism (CDM) under the Kyoto Protocol may induce a technological change in developing countries. As an alternative to the CDM-regime, developing countries may accept a (generous) cap on their own emissions, let domestic producers invest in efficient new technologies, and sell their excess emission permits on the international permit market (cap&trade-regime). We show that the incentive for investment in new technology may differ between the two alternative regimes. We also studied the incentives of major Annex I parties (e.g. the EU) to invite low-cost non-Annex I countries (e.g. China or India) to opt into the Kyoto emissions trading mechanism. One of the results is that profitable opt-in contracts can be designed especially when market power can be limited by means of, for instance, a minimum sales requirement. The theoretical analysis is supplemented by numerical simulations using a stylised model of the global carbon emissions permit market.

If there are inter-country positive externalities from R&D (research and development) directed towards reducing emissions or reducing abatement costs, an ideal international climate agreement would include elements affecting the countries' choice of R&D or R&D policies. Such elements may in practice be difficult to include (and are not included in the Kyoto agreement). Against this background, we therefore studied the properties of two types of international climate agreements when the inter-country externalities from R&D are not regulated through the climate agreement. With an international agreement on emission quotas, the equilibrium R&D subsidy will be lower than the socially optimal subsidy. The equilibrium subsidy is even lower if the climate agreement instead dictates that a common carbon tax should be imposed in each country. Under a quota agreement, total quotas should be set so low that the price of carbon exceeds the Pigovian level, while the opposite may be true under a tax agreement rather than under a quota agreement. Moreover, marginal costs of abatement should generally differ across countries in the quota agreement, due to differences in size and other characteristics between countries. This means that the second-best outcome cannot be achieved if emission quotas are tradable.

Because there are many weaknesses in the Kyoto agreement, alternatively designed climate agreements have been suggested, for example, coordinated R&D activities that reduce abatement costs for all firms. We compare an agreement focusing only on emissions (a Kyoto-type agreement) with an

agreement focusing solely on technology on the assumption that abatement costs will be affected by R&D in all firms through technology spillovers. In an emission agreement, emissions should be restricted so much that the carbon price exceeds the Pigovian level. For sufficiently low technology spillovers, an emission agreement is more efficient than a technology agreement specifying an R&D subsidy to be imposed on all firms in all countries. The opposite may hold if technology spillovers are sufficiently large. Finally, an alternative technology agreement specifying R&D expenditures in each country is more efficient than an agreement specifying an R&D subsidy.

One important issue relating to international climate agreements is the possibility of reaching large stable coalitions of cooperating countries. There is a large body of literature available on this topic. We have extended this by explicitly considering the fact that abatement adjustment processes take time. Results regarding coalition stability under the assumption of ‘farsightedness’ are generalized in this case, showing how large and small stable coalitions can occur, although this depends on the relative cost of abatement and emission levels.

B. Endogenous technology development

There is considerable uncertainty about the potential severity of future climate change. This uncertainty may have an impact on the appropriateness of designs for climate policy. In particular, this uncertainty can have different effects on the benefits of early abatement and R&D. We explore these differences, which depend in large part on the properties of the abatement cost function. With convex marginal costs, increased uncertainty leads to more early abatement, while concave costs allow for less early action in favour of research to reduce future costs. The results are illustrated by two competing technologies: a conventional one with linear costs and a backstop with fixed (but high) costs. Finally, we discuss these results in the context of existing climate models and scientific evidence.

The literature suggests that the optimal timing of environmental policy depends on determinants related to technology development, specifically on the role of R&D versus the role of learning by doing (LbD) in innovation. We develop and compare two models, the first with technological change through R&D and the second with Learning by Doing. Our R&D model extends the usual R&D model applied in environmental economics in two ways. First,

it includes an expiration date for patents. Second, it explicitly distinguishes the first-best case with environmental taxes and R&D subsidies that enable a planner to decentralize the social optimum from the second-best case in which a planner can only set environmental taxes. We study the dynamics of efficient environmental policy in these models and prove equivalence between the second-best R&D and the LbD model, meaning that both models lead to the same efficient environmental policy. Our analysis shows that the difference between R&D and LbD models can partly be traced back to the absence of a finite patent lifetime in earlier R&D models and to the set of policy instruments available, rather than being directly linked to the source of technological innovation. We illustrate our analysis through numerical simulations.

C. *Dynamics and time consistency*

Environmentalists are often upset at the effect of discounting costs of future environmental damage, e.g. due to climate change. One often-overlooked message is that we should discount costs while taking into account the increase in the relative price of the ecosystem service endangered. The effect of discounting would thus be counteracted, and if the rate of price rise of the item were fast enough, the effect might even be reversed. The scarcity that leads to rising relative prices for the environmental good will also have direct effects on the discount rate itself. The magnitude of these effects depends on properties of the economy's technology and on social preferences. We develop a simple model of the economy that illustrates how changes in crucial technology and preference parameters can affect both the discount rate and the rate of change in the values of environmental goods.

Markets for tradable emission permits may be affected by whether or not permits can be carried over from one period to another. This question is of particular relevance in climate change since developing countries can be brought into the climate change treaty through generous initial but gradually tightening emission quota allocations. It would then be of interest to know how large such an initial allocation can be without creating market power problems. We develop a theoretical model that defines such allocation limits, applying theoretical results to a global market for carbon dioxide emissions and the existing US market for sulphur dioxide emissions.

The most important greenhouse gas is CO₂, and the consumption of oil is one important source of this greenhouse gas. Understanding the oil market and

developing substitutes for oil are therefore important also for predicting future greenhouse gas emissions. We consider a situation where a strategic seller of a depletable resource such as oil faces price-taking buyers who, through their governments, can adopt technologies that permanently end their resource dependence. Adoption is irreversible and will alter demand infrastructure after a time lag. In equilibrium, a seller strategically maintains resource dependence by increasing supplies when stocks decline. Thus the model explains why decreasing resource reserves do not necessarily lead to decreasing supply levels, but rather to increasing supply, up to the point when the economy will have to switch towards substitute technologies.

D. Limited rationality, altruism and social interdependency of preferences

Individuals with a preference for keeping moral obligations may have an incentive to avoid information that indicates that voluntary contributions are socially valuable. The reason is that such information can increase such individuals' perceived burden of responsibility. For the duty-oriented morally motivated individual, an increase in the believed social value of contributions may increase contributions, but decrease utility. Thus the duty-oriented person has no incentive to seek this kind of information on his own initiative. Hence, information campaigns may increase voluntary contributions by providing unwanted information to the duty-oriented.

Social norms and intrinsic motivations lead to environmentally friendly behaviour even in the absence of environmental policy. We study the interactions of social norms and environmental regulation and their impact on individual behaviour. We show that tighter environmental policies may lead to a reduction of voluntary abatement efforts and may sometimes even increase emissions and environmental damage. The underlying reason is a kind of discouragement effect. Tighter environmental policy reduces the voluntary component of individual abatement and this affects the utility derived from voluntary abatement. Environmental externalities and externalities related to social norms and social standards interact. This leads to two remarkable results. First, even in perfectly competitive situations, emission taxes and command and control do not produce identical results. Second, emissions produced by socially concerned individuals should be taxed at higher rates than emissions by individuals that do not respond to social rewards.

9.5 Plans for the future

As mentioned above, we plan to arrange a follow-up workshop in August 2007. In addition to updating each other on ongoing work, project group members will take advantage of this workshop to discuss possible additional cooperation between the CAS researchers (and other participants). There are already several joint research projects among the CAS researchers that started towards the end of the CAS period. To mention a few: Johan Eyckmans and Snorre Kverndokk are working together on two projects, 'Can climate and development be reconciled?' and 'Moral motivation and climate agreements'; Reyer Gerlagh and Matti Liski are working together on 'Imperfect observability of stocks, oil dependency, and technology adoption'; Michael Hoel and Aart de Zeeuw are working together on 'Climate policy and R&D: Conventional versus breakthrough technologies'; and Michael Hoel and Matti Liski are working together on 'Electricity markets with hydropower and imperfect competition'.

As mentioned above, almost all the research will be submitted to academic journals. We are considering the possibility of publishing some of the articles in a book after they have been published as articles. We have been in contact with the two publishers, Edward Elgar and Cambridge University Press. Nothing is decided as yet, as we must first see when and in which journals the works will be published first. If we produce a book, it is likely to be published in 2008 based on work published in journals by the end of 2007.

9.6 Evaluation

My impression is that all the project group members found the CAS project very productive and enjoyable. We were all fascinated by being in a small group with very homogeneous research interests and working closely together. Small informal seminars were invaluable for our work. We also all enjoyed the isolation from everyday chores and the focus on intellectual exchanges. The material surroundings and administrative staff were most supportive and greatly appreciated.

No one in the group had any explicit suggestions for improvement.

9.7 List of publications

The following is a complete list of works written by the members of the CAS group while they have been at CAS. The extent of the work carried out at CAS varies considerably between the different papers, from papers that are written predominantly at CAS to papers where only the final revision was done at CAS.

9.7.1 *Papers already published or accepted for publication*

K.A. Brekke, R.B. Howarth, and K. Nyborg: "Green consumers and public policy: on socially contingent moral motivation", *Resource and Energy Economics*, forthcoming.

Johan Eyckmans: "International Environmental Agreements and the Case of Global Warming", Forthcoming in: M. Cogy, and K. Steiniger (eds), *Economics of Sustainable Development: International Perspectives* (Edgar Elgar, Cheltenham UK)

Reyer Gerlagh: "A Climate-Change Policy Induced Shift from Innovations in Carbon-Energy Production to Carbon-Energy Savings", forthcoming in *Energy Economics*.

Rolf Golombek and Michael Hoel: "Second-best Climate Agreements and Technology Policy", *Advances in Economic Analysis & Policy*: Vol. 6: No. 1, Article 1 (2006).

John Gutrich and Richard B. Howarth: "Carbon Sequestration and the Optimal Management of New Hampshire Timber Stands", *Ecological Economics*, forthcoming.

Michael Rauscher: "Umweltpolitik und Standortwettbewerb" (Environmental Policy and Locational Competition) Forthcoming in: Franz, W., H. J. Ramser, M. Stadler, Hrsg., Umwelt und Energie. Wirtschaftswissenschaftliches Seminar Ottobeuren, Band 35, Mohr Siebeck, Tübingen.

9.7.2 *Works in progress*

Rossella Bargiacchi and Aart de Zeeuw: "Stable coalitions with green investments" In final stage of completion.

Kjell-Arne Brekke, Gorm Kipperberg and Karine Nyborg: "Reluctant Recyclers: Social Interaction in Responsibility Ascription", will be submitted to an international journal during 2006.

Simon De Jaeger and Johan Eyckmans: "Do voluntary agreements with municipalities help to reduce residential garbage? A case study for Flanders"

Johan Eyckmans and Michael Finus: "An Almost Ideal Sharing Scheme for Coalition Games with Externalities," submitted to *Oxford Economic Papers*.

Johan Eyckmans and Cathrine Hagem: "EU – Russia – China – model of strategic emissions trading"

In progress, to be submitted to an international journal in 2006.

Carolyn Fischer and Thomas Sterner: "Climate policy, prudence, and the role of technological innovation"

Carolyn Fischer: "Emissions pricing, spillovers, and public investment in environmentally friendly technologies"

Carolyn Fischer and Alan Fox: "When Revenue Recycling Isn't Enough: Permit Allocation Strategies to Minimize Intra- and International Emissions Leakage"

Taran Fæhn, Antonio G. Gómez-Plana and Snorre Kverndokk: "Can a carbon permit system reduce Spanish unemployment?", Resubmitted to *Environmental and Resource Economics*

Reyer Gerlagh, Snorre Kverndokk and Knut Einar Rosendal: "Optimal timing of environmental policy; equivalence between R&D and LbD models".

Reyer Gerlagh and Onno Kuik: "Carbon Leakage with International Technology Spillovers"

Rolf Golombek and Michael Hoel: "Endogenous technology and tradable emission quotas". FEEM Working Paper 2006:42 and Memorandum from the Department of Economics, no. 3/2006

(<http://www.oekonomi.uio.no/memo/memopdf/memo0306.pdf>)

Submitted to Resource and Energy Economics in February 2006, in revise and re-submit process now.

Rolf Golombek and Michael Hoel: "Climate agreements: Emission quotas versus technology policies", Submitted to *Journal of Environmental Economics and Management* in September 2006.

Cathrine Hagem: "Clean development mechanism (CDM) vs. international permit trading – the impact on technological change". Submitted to *Resource and Energy Economics* in September 2006.

Cathrine Hagem and Hege Westskog: "Distributional constraints and efficiency in a tradable permit market" Submitted to *Journal of Environmental Economics and Management* in June 2006. Memorandum from the Department of Economics, no. 9/2006 <http://www.oekonomi.uio.no/memo/memopdf/memo0906.pdf>

Michael Hoel and Thomas Sterner: Discounting and relative prices: assessing future environmental damages. Resources for the Future Discussion Paper 06-18. Submitted to *Climatic Change* in February 2006; in revise and resubmit process now.

Richard Howarth: "Rethinking the Theory of Discounting and Revealed Time Preference" Submitted to *Environmental and Resource Economics* in July 2006

Matti Liski and Reyer Gerlagh: "A model of strategic oil-dependence", first draft August 2006.

Matti Liski and Juan-Pablo Montero: "Market Power in a Storable-Good Market: Theory and Applications to Carbon and Sulfur Trading", MIT-CEEPR, WP-2005-016. pdf Submitted Dec 2005

Matti Liski and Pauli Murto: "Backstop Technology Adoption", HECER WP 2006-05.pdf Submitted Jan 2006.

Matti Liski and Juan-Pablo Montero: "Forward trading in a depletable-stock oligopoly", submission expected during fall 2006 (probably *Journal of Economic Theory*)

Matti Liski and Harri Nikula: "Prices vs. quantities and baseline uncertainty", work in progress.

Karine Nyborg: "I Don't Want to Hear About it: Rational Ignorance among Morally Motivated Consumers". To be submitted to an international journal in 2006.

Michael Rauscher: Dynamics of Agricultural Groundwater Extraction. Submitted to *Ecological Economics*.

Michael Rauscher: Hot Spots, High Smokestacks and the Geography of Pollution. Will be submitted to an international journal during 2006.

Michael Rauscher and Edward B. Barbier: "Biodiversity and Geography" In progress, Submission to an international journal during 2006.

Michael Rauscher: "Voluntary Emission Reductions, Social Rewards, and Environmental Policy", will be submitted to an international journal in 2006.

Cees Withagen and Aart de Zeeuw: *Market Dynamics: Imperfect Competition and Non-renewable Resources*. This book will be published by Princeton University Press.

Aart de Zeeuw: Dynamic effects on the stability of international environmental agreements. Revise and resubmit at the *Journal of Environmental Economics and Management*.

10. *Statistical Analysis of Complex Event History*

Data

Report by Odd O. Aalen and Ørnulf Borgan
Group leaders 2005/2006

1 October, 2006

10.1 General description

Event history analysis is a set of statistical concepts, models and methods for studying the occurrences of events over time for a number of subjects. The subjects may be humans, animals, or technical equipment, while the events may be deaths, the onset of disease, relapses of cancer patients, or failures of technical equipment. The aim of an investigation may be to establish risk factors for a disease, to study the effect of a medical treatment or to predict future occurrences of an event. Medicine is the main area of application for event history analysis, which is also the main focus of the project 'Statistical Analysis of Complex Event History Data'. Other important applications include demography, econometrics, sociology and technical reliability.

Event history data are rarely fully observed. Usually, events related to a subject are only registered if they fall within an observation window, while events outside that window are unknown to the researcher. This is one crucial reason why special statistical methods are needed to analyse event history data. Modern event history analysis has been developed over the past 30 to 40 years, motivated mainly by medical research, but also by problems in econometrics and technical reliability. Today, event history analysis has evolved into an area of statistical science featuring its own concepts, models, and methods.

Although great advances have been made in event history analysis in recent decades, the field still remains dominated by the classical methods for single-event times (Kaplan-Meier estimator, logrank test, Cox regression), and existing methodologies are not always easily adapted to the more ambitious research questions and richer data structures of contemporary research:

- One example of the richer data structures that are emerging involves bio-medical event history data with multiple transitions between health states, or the occurrence of recurrent events in parallel with time-dependent partially observed stochastic marker processes for disease progression. A common approach to such data is to divide it into sequential event times which are analysed separately using standard methodology for single-event times. Methods for a joint analysis of marker and event processes are emerging, but need to be further developed.
- One example of the more ambitious questions posed by contemporary research involves how to deduce causality from statistical data. Different approaches have been proposed: graphical models, predictive causality and counter-factual causality. As causality is based on the notion that the past influences the present and the future, event history modelling should play a more central role in the causality literature than is the case today.

The aim of the project ‘Statistical Analysis of Complex Event History Data’ has been to make substantial contributions to the methodology for analysing complex event histories, as indicated by the above-mentioned and related problems.

10.2 Members of the project group

The following researchers have been members of the project group:

- *Odd Olai Aalen* (group leader), Professor, Department of Biostatistics, University of Oslo
- *Ørnulf Borgan* (group leader), Professor, Department of Mathematics, University of Oslo
- *Per Kragh Andersen*, Professor, Department of Biostatistics, Copenhagen University
- *Hege Marie Bøvelstad*, Research Fellow, Department of Mathematics, University of Oslo
- *Vanessa Didelez*, Lecturer, Department of Statistical Science, University College London
- *Geir Egil Eide*, Associate Professor, Department of Public Health and Primary Health Care, University of Bergen
- *Johan Fosen*, Research Fellow, Department of Biostatistics, University of Oslo and Statistics Norway

- *Axel Gandy*, Research Fellow, Department of Stochastics, University of Ulm
- *Håkon Gjessing*, Professor, Division of Epidemiology, Norwegian Institute of Public Health
- *Jon Michael Gran*, Research Fellow, Department of Biostatistics, University of Oslo
- *Nina Gunnes*, Research Fellow, Department of Biostatistics, University of Oslo
- *Robin Henderson*, Professor, School of Mathematics and Statistics, University of Newcastle upon Tyne
- *Nils Lid Hjort*, Professor, Department of Mathematics, University of Oslo
- *Niels Keiding*, Professor, Department of Biostatistics, Copenhagen University
- *Jan Terje Kvaløy*, Associate Professor, Department of Mathematics and Science, University of Stavanger
- *Bo Henry Lindqvist*, Professor, Department of Mathematical Sciences, Norwegian University of Science and Technology
- *Torben Martinussen*, Associate Professor, Department of Mathematics and Physics, The Royal Veterinary and Agricultural University, Frederiksberg, Denmark
- *Ståle Nygård*, Research Fellow, Department of Mathematics, University of Oslo
- *Sven Ove Samuelsen*, Associate Professor, Department of Mathematics, University of Oslo
- *Thomas Harder Scheike*, Associate Professor, Department of Biostatistics, Copenhagen University
- *Hans van Houwelingen*, Professor, Medical Statistics and Bioinformatics, Leiden University Medical Center

In addition to the members of the project group, the following researchers have had short visits for research collaboration and in connection with guest lectures at workshops and seminars: Elja Arjas (Helsinki), Christine Böhm (Freiburg), Norman Breslow (Seattle), Daniel Commenges (Bordeaux), Sir David Cox (Oxford), Somnath Datta (Louisville), Ludwig Fahrmeir (Munich), Daniel Farewell (Cardiff), Vern Farewell (Cambridge), Larry Goldstein (Los Angeles), Philip Hougaard (Copenhagen), Bryan Langholz (Los Angeles), Mei-Ling Ting Lee (Harvard), Danyu Lin (Chapel Hill), Judith Lok (Harvard), Trond Anders Moger (Oslo and Seattle), Susan Murphy (Ann Arbor), Juni Palmgren (Stockholm), James Robins (Harvard), Glen Satten (Atlanta), Nuala A. Sheehan (Leicester), and Åke Svensson (Stockholm).

10.3 Workshops, meetings and seminars

The project group organized a number of workshops meeting and seminars as an integral part of its activities.

10.3.1 *Workshop on Statistical Analysis of Complex Event History Data* Norwegian Academy of Science and Letters, 31 August to 2 September 2005.

The senior members of the project group and 16 other leading international scientists were invited to present their research at the workshop, to discuss the state of the art with regard to methodologies for analysing complex event history data, and to identify and discuss important directions for further research. In addition, about 30 Norwegian researchers attended the workshop. The programme for the workshop is posted at: <http://www.cas.uio.no/Groups/0506Statistical/Workshop.html>. Thirteen of the talks have been further developed and form the basis of scientific papers that will appear in March 2007 in a special issue of the *Scandinavian Journal of Statistics* edited by Ørnulf Borgan.

10.3.2 *Meeting on Biostatistical Modelling in the Medical Sciences* Norwegian Academy of Science and Letters, 5 December 2005

Members of the project group were key contributors to an application to the Research Council of Norway for a Centre of Excellence in Biostatistical Modelling in the Medical Sciences, proposing Odd Aalen as director of the centre and including the participation of biostatisticians, bioinformaticians, and biomedical researchers. The application was submitted in October 2005, and the purpose of the meeting was to gather the researchers involved in the application for discussions and to look ahead to the second round of applications. The programme for the meeting is posted at: http://www.med.uio.no/imb/stat/bmms/previous_meetings/ProgramCentreMeetingDec05.pdf. [In May 2006, the application was selected as one of 26 (of a total of 99) applications to move on to the second round. The decision as to which centres will be established will be taken by the Research Council of Norway in January 2007.]

10.3.3 *Internal workshops, Jeløya, 17–18 January, and Tuddal, 21–23 March, 2006*

The project group organized two internal workshops. The purpose of both was to conduct concentrated discussions among the project group members regarding the ongoing research projects in a relaxed atmosphere.

10.3.4 *Meeting on Modern Statistical Methods in Epidemiology, Norwegian Academy of Science and Letters, 27 March 2006*

The meeting was organized by the project group in collaboration with the Centre for Biostatistical Modelling in the Medical Sciences with the aim of introducing modern statistical methods, in part developed by the project group, to an audience of epidemiologists. The programme for the meeting is posted at:

http://www.med.uio.no/imb/stat/bmms/previous_meetings/ProgramMarch27-2006.pdf.

10.3.5 *Workshop March 2007*

The project group is planning to organize a concluding workshop in March 2007. The workshop will focus on stock-taking and looking ahead to future research collaboration among the members of the project group.

In addition to the above-mentioned workshops and meetings, the members of the project group have given a number of seminars at the Departments of Mathematics and Biostatistics at the University of Oslo, as well as guest lectures at other universities and international meetings. In particular, parts of our research were presented in a special invitation-only session at the 21st Nordic Conference on Mathematical Statistics in Rebild, Denmark, in June 2006. Odd Aalen and Ørnulf Borgan organized the session, and Robin Henderson, Vanessa Didelez, and Torben Martinussen were the guest speakers.

10.4 Research results

The following is an overview of the main research themes addressed by the project 'Statistical Analysis of Complex Event History Data' and a brief review of what has been achieved. The key contributors are indicated for each theme.

10.4.1 Hazard regression (*Aalen, Gandy, Hjort, Martinussen, Scheike*)

Regression methodology is a basic tool in event history analysis. Cox's proportional hazards model is a commonly used method. However, the assumptions in Cox's model are often not fulfilled. It is becoming increasingly clear that other methods must be used as well; the additive hazards regression model proposed by Odd Aalen offers one such alternative. A number of methodological challenges associated with regression modelling for event history data have been studied in the project:

- Two new tests for time-varying effects in the additive hazards model have been developed, and an additive change-point model has been studied.
- A new test for deciding whether to use proportional or additive hazard regression modelling has been developed using the Mizon-Richard encompassing principle.
- Global tests in the additive hazards regression model have been studied and further developed.
- A new way of dealing with inference for the additive hazards regression model using the underlying least squares criterion as a summary of the model has been studied. This leads to a very simple logic for constructing tests for various hypotheses by directly mimicking the theory for standard linear regression models.
- An extension of the semi-parametric transformation model that specifies a time-varying regression structure for the transformation, and thus allows time-varying structure in the data has been studied.
- Work is under way to study new methods for model selection, model averaging and goodness-of-fit for the additive hazards regression model.

10.4.2 *Recurrent events and longitudinal data (Borgan, Henderson, Kvaløy, Lindqvist)*

Traditionally, event history analysis and the analysis of longitudinal data have been seen as vary separate areas of statistics, and the process point of view that is common in event history analysis has not played the same salient role in longitudinal data analysis. Inspired by event history analysis, new methods for longitudinal data analysis have been developed by the project:

- A methodology for the analysis of longitudinal data subject to possibly informative dropout has been developed. The key to the new methodology is to treat dropout as an event in time rather than as an indicator of missing data.
- An additive dynamic regression model for longitudinal binary data subject to intermittent missingness and dropout has been developed, exploiting the similarity between longitudinal binary data and recurrent event data. The methodology has been applied to the analysis of diarrhoea among Brazilian children, and a study using similar methodology to analyse data on cardiopulmonary resuscitation is under way.

Models for recurrent event data are usually either of the Poisson process type or of the renewal process type. Motivated by applications related to technical reliability, a new class of models have been developed. These are known as trend-renewal processes and they generalise both non-homogeneous Poisson processes and renewal processes. Studies have also been made of how to incorporate observed covariates and unobserved heterogeneity into the models.

10.4.3 *Causality and graphical models (Aalen, Borgan, Didelez, Fosen, Keiding)*

For most of the 20th century, the dominant attitude was that statistics are based on associations, and that one can rarely draw causal conclusions from a statistical analysis. In recent years, a more proactive attitude to the causality concept has evolved among statisticians. The project has involved work with the causality concept both from a statistical and a philosophical point of view. In statistical causality, the issue of time has played far too modest a role, despite the fact that the passage of time is obviously of fundamental impor-

tance when viewing causal connections. The project group has worked with a number of statistical models, concepts and methods related to causality that explicitly take time into account:

- We have developed an extension of classical path analysis to suit a situation where variables may be time-dependent and where the outcome of the main interest is a stochastic process. The approach is especially fruitful for analysing event history data with recurrent events or internal time-dependent covariates, where an ordinary regression analysis may fail. The approach enables us to describe how the effect of a fixed covariate works partly directly and partly indirectly through dynamic covariates.
- To better analyse the influence of time, variations of the concept of Granger causality and local independence have been studied using graphical models. These allow for an intuitive representation of complex dependence structures, and other important properties of the statistical models, e.g. behaviour under marginalization, can be read from the graphs.
- Graphical models for causal inference of event history data aim not simply to describe dynamic dependence structures, but also to predict the effects of interventions or other external changes in a system. Our studies show that sequential interventions on the one hand and the direct/indirect effect theory on the other follow the same principles.
- Work is under way to understand how graphical models can offer guidance for handling time-dependent confounders under retrospective and other complex sampling patterns in epidemiology. The aim is to establish graphical rules that allow the characterisation of situations in which the causal effect can still be identified under outcome-dependent sampling.

10.4.4 *Multistate models (Aalen, Andersen, Borgan, Gunnes, Scheike)*

Multistate models are useful for describing event histories involving a number of different events happening to a single individual. The theory for such models is well developed for the case of Markov models, but a number of methodological problems remain unsolved for the non-Markovian models that offer a more realistic modelling option for many applications. New methods for multistate models have been developed in the project, and the properties of some established methods have been further investigated:

- The classical approach to studying the effects of covariates in multistate models is to perform separate regression modelling for each of the transition

intensities, and then synthesizing them into transition probabilities. However, even for simple multistate models, such transition probabilities will be quite complicated functions of the covariates. It would be of interest to develop models that regress the transition probabilities directly on the covariates. Two approaches to such regression modelling have been studied in the project, one based on pseudo-observations and one using inverse probability of censoring weighting. Both approaches have been used to study leukaemia-free survival for leukaemia patients who have had a bone marrow transplants.

- Using simulated and real data, the properties of the Aalen-Johansen and Datta-Satten estimators of the state occupation probabilities have been compared for non-Markov models under dependent censoring. Our study shows that the Aalen-Johansen estimator, which has been developed for the Markov case, performs better than the more general Datta-Satten estimator in a number of situations encountered in actual practice.

10.4.5 *Prediction and attributable fraction (Eide, Samuelsen, van Houwelingen)*

In clinical practice it is important to have reliable methods for survival prediction, in particular for patient counselling, but also for assessing the future needs of various health related services. A related problem occurs in epidemiology in connection with the need to assess which fraction of the occurrences of a disease may be attributed to a specific exposure, and could therefore (potentially) be avoided if the exposure were removed from the population. Two projects on these topics have been undertaken by the project group:

- Survival prediction based on Cox's regression model may yield wrong conclusions, since the proportional hazards assumption may be violated. One useful alternative is to dynamically adjust predictive Cox regression models during follow-up. This updating is achieved by directly fitting models for the individuals still at risk at a number of landmarking points. Using this approach, simple Cox regression models are able to catch the development over time for situations with time-varying effects of the covariates or with internal time-dependent covariates.
- For survival data, time from exposure will influence the risk of a disease, and this has not been well accounted for in the existing methods for estimating the attributable fraction. To handle the attributable fraction for survival times in a coherent way, precise definitions of the attributable fraction measures

are needed. Three such measures are defined (attributable hazard fraction, attributable fraction before time t , attributable fraction within study), allowing estimators of these for right censored survival data to be derived.

10.4.6 Cohort sampling (Borgan, Samuelsen)

Cohort sampling methods, like the nested case-control and case-cohort designs, have been developed in response to the need to have available study designs which take the time aspect in the development of a disease into account, and at the same time they combine the cost-effectiveness of a classical case-control study with the greater validity of a cohort study. The project group has further developed the statistical methodology for cohort sampling methods:

- We have shown how the variance estimates for regression coefficients in exposure stratified case-cohort studies can be obtained from influence terms routinely calculated in standard software for Cox regression.
- We have developed case-cohort methods that allow for an efficient computation when using survival data on families from large population registers.
- We have developed a new method for assessing goodness-of-fit for nested case-control data using martingale residuals.

10.4.7 High dimensional covariates (Borgan, Bøvelstad, Nygård)

Survival prediction from high-dimensional genomic data has been subject to much research in the past few years. These kinds of data are associated with the methodological problem of having many more explanatory variables than subjects under study. Most of the methods handle this using Cox's proportional hazards model and obtain parameter estimates using dimension reduction or parameter shrinkage. Two studies on survival prediction from high-dimensional genomic data have been performed by the project group:

- We have developed an improved method for partial least squares (PLS) Cox regression that allows for joint estimation of the effect of genomic data and traditional clinical and demographic risk factors.
- We have compared the performances of six survival prediction methods based on Cox regression applied to three microarray gene expression data sets. Our study shows that the commonly used selection methods perform poorly, while

principal components regression (PCR), PLS regression and ridge regression have comparable properties, with ridge regression being slightly better than the other two.

10.4.8 *Infectious diseases (Aalen, Gran, Lindqvist)*

When studying event histories, it is usually assumed that they develop independently for different individuals. This is often not the case, e.g. when studying infectious diseases. The project group has started work on infectious disease modelling in close collaboration with the Norwegian Institute of Public Health; in particular, a study is underway on reproduction numbers and growth rates in epidemic models applied to a model for HIV/AIDS progression.

10.4.9 *Monographs (Aalen, Borgan, Gjessing, Hjort)*

As an integrated part of the research in the project, Odd Aalen, Ørnulf Borgan and Håkon Gjessing have been working on the monograph *Event History Analysis: A Process Point of View*. The book, due to be published by Springer-Verlag in 2007, will offer a broad perspective of modern event history analysis and summarize a number of the research topics listed above.

Nils Hjort used part of his time to work on the monograph *Model Selection and Model Averaging* (with Gerda Claeskens), due to be published by Cambridge University Press in 2007. While taking part in the project group, his focus was on how various general methods can be applied to hazard regression models.

10.5 The research in a larger perspective

The project 'Statistical analysis of complex event history data' has been an important epoch in a research process that started prior to the project at CAS and will continue after the project year. This section describes how the project fits into the larger perspective, how it has been beneficial for the research process as a whole, and how the research will be carried on after the project year.

For quite some time, event history analysis has been an important research topic among statisticians at the University of Oslo. The group leaders (Aalen, Borgan) and others (Gjessing, Hjort, Samuelsen) have made important contributions to international development in the field. In 2000, Aalen and Borgan took the initiative to establish a working group in event history analysis in the Oslo area. The aim of the working group (called NOREVENT) was to create a common environment for researchers in event history analysis across institutional boundaries for the purpose of (i) strengthening collaboration among statisticians in academia and collaboration between statisticians in academia and biostatisticians at the Norwegian Cancer Registry and the Norwegian Institute of Public Health, (ii) further strengthening international collaboration, (iii) improving the recruitment of young researchers to the field, and (iv) increasing the awareness and knowledge among medical researchers of up-to-date methodology for analysing event history data. NOREVENT was soon designated a thematic research area at the Faculty of Medicine, University of Oslo, and its status that was renewed in 2005. At about the same time, NOREVENT changed its name to Centre for Biostatistical Modelling in the Medical Sciences (BMMS). For more information on the activities of BMMS, see www.med.uio.no/imb/stat/bmms/.

The project year at CAS made it possible for key BMMS researchers to focus on a number of methodological problems related to the analysis of complex event history data and to benefit from the close contact and collaboration with colleagues from abroad. Having all researchers working away from their home departments, at first-rate facilities and with the support of the professional and friendly staff at CAS provided the best possible conditions for research progress in the form of joint projects and professional discussions. The only thing we occasionally missed was a seminar room downstairs equipped with whiteboard and a projector.

An application to the Research Council of Norway that will turn BMMS into a Centre of Excellence is through to the second round, and the decision will be made in January 2007 (cf. above). If the application goes through, it will create a leading international centre for research in event history analysis and related fields in the Oslo area. Otherwise, BMMS will continue as a thematic research area at the Faculty of Medicine, University of Oslo. In other words, the research from the project year at CAS will be followed up within the framework of BMMS in any case. To this end, the close personal and profes-

sional contacts among key international researchers established during the project year will be invaluable, and arrangements have already been made for further research visits to Oslo.

10.6 Publications

10.6.1 Books

Aalen, O. O., Borgan, Ø. and Gjessing, H.K. *Event History Analysis: A Process Point of View*. Monograph to be published by Springer-Verlag, New York.

Claeskens, G. and Hjort, N. L. *Model Selection and Model Averaging*. Monograph to be published by Cambridge University Press.

10.6.2 Papers in peer-reviewed international journals (published or accepted for publication)

Aalen, O. O. and Didelez, V. Discussion of "Semiparametric analysis of case series data" by Farrington, C. P. and Whittaker, H. J. *Journal of the Royal Statistical Society: Series C (Applied Statistics)* 55: 587.

Aalen, O. O. and Frigessi, A. What can statistics contribute to a causal understanding? *Scandinavian Journal of Statistics*, to appear.

Andersen, P. K. and Klein, J. P. Regression analysis for multistate models based on a pseudo-value approach, with applications to bone marrow transplantation studies. *Scandinavian Journal of Statistics*, to appear (published online August 2006: doi: 10.1111/j.1467-9469.2006.00526.x).

Borgan, Ø. Discussion of "Semiparametric analysis of case series data" by Farrington, C. P. and Whittaker, H. J. *Journal of the Royal Statistical Society: Series C (Applied Statistics)* 55: 589.

Borgan, Ø., Fiaccone, R. L., Henderson, R. and Barreto, M. L. Dynamic analysis of recurrent event data with missing observations, with application to infant diarrhoea in Brazil. *Scandinavian Journal of Statistics*, to appear (published online August 2006 doi: 10.1111/j.1467-9469.2006.00525.x).

- Didelez, V. Graphical models for composable finite Markov processes. *Scandinavian Journal of Statistics*, to appear (published online September 2006 doi: 10.1111/j.1467-9469.2006.00528.x).
- Fosen, J., Borgan, Ø., Weedon-Fekjær, H. and Aalen, O. O. (2006). Dynamic analysis of recurrent event data using the additive hazard model. *Biometrical Journal* 48: 381–398, 2006.
- Fosen, J., Ferkingstad, E., Borgan, Ø. and Aalen, O. O. Dynamic path analysis – a new approach to analyzing time-dependent covariates. *Lifetime Data Analysis* 12: 143–167, 2006.
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- Gunnes, N., Borgan, Ø. and Aalen, O. O. Estimating stage occupation probabilities in non-Markov models. *Lifetime Data Analysis*, to appear.
- Lindqvist, B. H. On the statistical modelling and analysis of repairable systems. *Statistical Science*, to appear.
- Rosthøj, S., Fullwood C., Henderson, R. and Stewart, S. Estimation of optimal dynamic anticoagulation regimes from observational data: a regret-based approach. *Statistics in Medicine*, to appear.
- Samuelsen, S. O., Bakketeig, L. S., Tretli, S., Johannesen, T. B. and Magnus, P. Head circumference at birth and risk of brain cancer in childhood: a population-based study. *Lancet Oncology* 7: 39–42, 2006.
- Scheike, T. H. A flexible semiparametric transformation model for survival data. *Lifetime Data Analysis*, to appear.
- Scheike, T. H. and Keiding, N. Design and analysis of time-to-pregnancy. *Statistical Methods in Medical Research* 15: 127–140, 2006.
- Scheike, T. H. and Zhang, M.-J. (2006). Direct modeling of regression effects for transition probabilities in multistate models. *Scandinavian Journal of Statistics*, to appear.
- Scheike, T. H., Zhang, M.-J. and Gerds, T. Predicting cumulative incidence probability by direct binomial regression. *Biometrika*, to appear.

Van Houwelingen, H. C. Dynamic prediction by landmarking in event history analysis. *Scandinavian Journal of Statistics*, to appear (published online 12-Sep-2006 doi: 10.1111/j.1467-9469.2006.00529.x).

10.6.3 *Papers submitted to peer-reviewed international journals*

Didelez, V. Graphical models for marked point processes based on local independence.

Diggle, P., Farewell, D. and Henderson, R. Analysis of longitudinal data with dropout: objectives, assumptions and a proposal.

Gandy, A., Therneau, T. M. and Aalen, O. O. Global tests in the additive hazards regression model.

Gjessing, H. K. and Lie, R. T. Biometrical modeling in genetics: are complex traits too complex?

Kvaløy, J. T. Modelling seasonal and weather dependency of cardiac arrest using the covariate order method.

Klein, J. P., Logan, B., Harhoff, M. and Andersen, P. K. Analyzing survival curves at a fixed point in time.

Lindqvist, B. H. and Skogsrud, G. Modelling of dependent competing risks by first passage times of Wiener processes.

Martinussen, T., Aalen, O. O. and Scheike, T. H. The Mizon-Richard encompassing test for the Cox and Aalen additive hazards models.

Martinussen, T. and Scheike, T. H. Aalen additive change-point model.

Martinussen, T. and Scheike, T. H. Tests for time-varying covariate effects within Aalen's additive hazards model.

Moger, T. A., Pawitan, Y. and Borgan, Ø. Case-cohort methods for survival data on families from routine registers.

Samuelsen, S. O., Ånestad, H. and Skrdal, A. Stratified case-cohort analysis of general cohort sampling designs.

Scheike, T. H., Rylander, L., Carstensen, L., Keiding, N., Jensen, T., Strömberg, U., Joffe, M. and Akre, O. Time-trends in human fertility: A population based study from Sweden.

10.6.4 *Papers printed or to appear in special publications*

Borgan, Ø and Langholz, B. Using martingale residuals to assess goodness-of-fit for sampled risk set data. To appear in V. Nair (ed): *Advances in Statistical Modeling and Inference. Essays in Honor of Kjell A. Doksum*. World Scientific, Singapore.

Didelez, V. Asymmetric separation for local independence graphs. Pages 130–137 in *Proceedings of the 22nd Annual Conference on Uncertainty in Artificial Intelligence*. UAI Press, Oregon, 2006.

Didelez, V., Dawid, A. P. and Geneletti, S. (2006). Direct and indirect effects of sequential treatments. Pages 138–146 in *Proceedings of the 22nd Annual Conference on Uncertainty in Artificial Intelligence*, 138–146. UAI Press, Oregon, 2006.

Hjort, N. L. Focused information criteria for the linear hazard regression model. To appear in F. Vonta, M. Nikulin, N. Limnios and C. Huber (eds): *Statistical models and methods for biomedical and technical systems*. Birkhauser, Boston.

Martinussen, T. and Scheike, T. H. Tests for time-varying covariate effects within Aalen's additive hazards model. To appear in J. Fine and S. Datten (eds): *Statistical Advances in Biomedical Sciences: State of the Art and Future Directions*.

Scheike, T. H. Estimation for the semiparametric transformation model for survival data and extensions. To appear in V. Nair (ed): *Advances in Statistical Modeling and Inference. Essays in Honour of Kjell A. Doksum*. World Scientific, Singapore.

10.6.5 *Papers in preparation*

Bøvelstad, H., Nygård, S., Størvold, H. L., Aldrin, M., Borgan, Ø., Frigessi, A. and Lingjærde, O. C. Methods for predicting survival from microarray data – a comparative study.

Didelez, V. and Kreiner, S. Direct and indirect effects – an application with DIGRAM.

Didelez, V., Kreiner, S. and Keiding, N. Graphical models for causal inference under outcome dependent sampling.

Gandy, A. Efficient computation of p-values based on sampling.

Gandy, A. and Hjort, N. L. Model selection and averaging in linear hazard rate regression models.

Gran, J. M., Wasmuth, L., Amundsen, E. J., Lindqvist, B. and Aalen, O. O. Growth rates in epidemic models: Application to a model for HIV/AIDS progression.

Hjort, N. L. And quiet does not flow the Don: Statistical analysis of a quarrel between Nobel laureates.

Hjort, N. L. A process threshold model for episode data.

Hjort, N. L. Hazard rates from gamma process level crossings.

Nygård, S., Borgan, Ø. Lingjærde, O. C. and Størvold, H. L. Handling additional covariates in Cox regression on gene expression data

Samuelson S. O. and Eide G. E. Attributable fractions with survival data.

Scheike, T. H. and Martinussen, T. Tests within the Aalen's additive hazards model: A least squares approach.

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Centre for Advanced Study

at the Norwegian Academy of Science and Letters

Senter for grunnforskning

ved Det Norske Videnskaps-Akademi

Drammensveien 78

NO-0271 Oslo,

Norway

Telephone: +47 22 12 25 00

Telefax: +47 22 12 25 01

E-mail: cas@cas.uio.no

Website: <http://www.cas.uio.no/>