

**RESEARCH ASSESSMENT
EXERCISE 1999**

RESEARCH ASSESSMENT EXERCISE 1999

UNIVERSITY OF HELSINKI

Evaluation Projects of the University of Helsinki 6/2000

Research Assessment Exercise 1999

Esa Hämäläinen (ed.)

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Full material: <http://savotta.helsinki.fi/researcheval>

PREFACE

Quality assurance has recently become a fashionable theme in all academic institutions. As such it is not a new idea, since internal assessment has been a trade mark of the scientific community: reports of referees and experts are as a rule employed in making decisions concerning scientific publications, academic appointments, and research funding. But a novel trend of science policy has been the extension of these peer review methods (in combination with various kinds of performance indicators) for the evaluation of larger units - such as research groups and departments. For example, a series of evaluations of specific research fields was started in 1983 by the Academy of Finland.

Scientific research and research-based teaching are the main functions of a university. It is, therefore, clear that assessing the quality of research is a crucially important concern in the management of universities. The research assessment exercise organised in the University of Helsinki in 1999 was the first of its kind in Finland. Its clearly stated aim was to introduce a quality dimension in the formula used for allocating finances between the faculties. At the same time, we hoped that international panels give useful comments and suggestions for improving our research environments. The decision to repeat the assessment in five years should also serve as an incentive to the quest of high quality within all departments.

The University of Helsinki is grateful to a great number of persons who in various ways contributed to the research assessment exercise. This book gives a documentary summary of the methods that we decided to use. The reports of the panels are available in the web (<http://savotta.helsinki.fi/researcheval>), but we include here as illustrations two of them. I hope that this book will be useful and instructive for others who are interested to follow us in similar efforts.

*Professor Ilkka Niiniluoto
Vice-Rector*

CONDUCT OF THE EXERCISE

Introduction

On 24 March 1999 a conference was organized in Bristol to discuss the intellectual consequences of the British Research Assessment Exercises, the fourth of which had been conducted in 1996. A number of people from all over the United Kingdom expressed their positive or negative views on the system of producing ratings to be used in funding allocations. Mr Bahram Bekhradnia, Director of the Higher Education Funding Council for England, claimed that the RAE should permanently take its place alongside death and taxes in British academic life. From the other side, Dr Charles Martindale, Professor of Latin at the University of Bristol, retorted: “We all die, and most of us pay taxes; but only Britain engages in the bizarre form of public spectacle we call the RAE.”

Whatever other merits his address may have had, Professor Martindale was here demonstrably wrong. At the very moment he was speaking, the preparations for the first Finnish RAE were almost finished and its materials were being sent to the evaluation panels (many of whose members came from British universities). In slightly more than six months, this Exercise was completed, and although criticized regarding many details, it was seen by the majority of the assessed units as a tolerable way of measuring research quality. This report on the conduct of the Helsinki RAE will describe its general plan, practical operation, results, and immediate financial consequences.

The organizers of the Helsinki evaluation reaped much benefit from the British experiences, which were available on the World Wide Web. Consequently, many basic principles were the same, such as: assessing research quality through a process of peer review, assembling the departments in a limited number of groups, each assessed by a panel of experts, and focusing on published output as the primary evidence of quality. On the other hand, there were also notable differences in approach and method. Some of them were due to the peculiar situation at the University of Helsinki, and many were seen by the British evaluators as significant improvements to the system which they knew from their own country.

Background

The Research Evaluation at the University of Helsinki was motivated by new developments in the Finnish University funding policy. In the late 1990s, the Ministry of Education introduced a mathematical model for allocating money to the Universities. The model included exclusively quantitative criteria, like the number of basic and doctoral degrees. The University of Helsinki was concerned that in the long run this might lead to an unhealthy competition between Universities, resulting in a general inflation of degree quality. Furthermore, the University found it peculiar that research, one of the main University functions, had been totally left out of the model. To highlight these viewpoints, the University decided to mount a Research Assessment Exercise, which was to give a fair and truthful picture of research quality in its individual departments. As no numerical indicators were thought to reflect quality in a reliable way, peer review was considered the only reasonable method. The results of the Exercise were to be used in the University's own internal model for the allocation of funds.

Initially, a common evaluation was proposed by the University of Helsinki to the other Finnish Universities. The response was mixed, with some Universities declining for a variety of reasons, and most others laying down conditions which were difficult to fulfil. Thus, the evaluation was restricted to only one University, albeit by far the largest and most diversified of all Finnish higher education institutions, with nine faculties, about 3000 faculty members and 34 000 students. The cost of the evaluation was estimated at 3 million FIM (500 000 euro); the final cost was somewhat less, 2.6 million FIM.

Organization

On 21 Oct 1998 the University Senate approved the total plan for the Assessment, drafted by a small group of former Chancellors and other eminent scholars. According to the plan, the practical conduct of the Exercise was to be governed by the Scientific Board of the University. The Board consisted of 14 members drawn from all faculties, with Vice Rector Ilkka Niiniluoto as Chair. At the early stages of the process, the Board convened very frequently to draw up a detailed plan for the Assessment, to compose the list of scholars to be invited to the panels and to establish the evaluation criteria. Later on, the Board assumed a supervisory role, meeting less regularly and being consulted by e-mail as the need arose. After the panels had submitted their reports, the Board was responsible for summing up the results and for deducing numerical coefficients for the Faculties. (See Annex A for the project schedule.)

The Exercise was operatively managed by a smaller group, which consisted of Vice Rector Niiniluoto, Evaluation Officer Dr Antti Arjava (seconded for the Assessment from the Department of Classics), and Planning Officer Mr Esa Hämäläinen (from the Strategic Planning of the University). This group drafted all the documents approved by the Scientific Board. The Evaluation Officer and Planning Officer accompanied the Panels during their visit and provided additional information according to the panels' wishes. They were usually present when the panels discussed their reports and ratings. (See Annex B for the persons involved in the planning and management of the project.)

Most of the correspondence with the panels and with the departments of the Uni-

versity was conducted through e-mail, a fact which greatly facilitated and speeded up the process. As the departments submitted their written material also in electronic form, it could be placed on the web at the same time as it was sent to the panels. It should be mentioned, though, that the panels overwhelmingly preferred hard copies to web pages. Thus, the web primarily served the purpose of distributing information within and outside the University, and it served this function well.

Panels

The 115 departments and research institutes of the University were divided into 24 different fields, each covered by one evaluation panel (Annex C). The number of departments assessed by a panel varied greatly according to the field and the size of the departments. Some panels (such as Chemistry) had only one large department to assess, others had to assess as many as twelve departments (Clinical Medicine and Dentistry). Because the panel division was expected to reflect the most natural combinations of departments, so that each panel would cover its expert field as effectively as possible, some smaller Faculties were assessed by only a single panel. Such were the Faculties of Law, Education, and Veterinary Science, and the same held almost true for the Theological Faculty as well, where only one small department was assessed separately from the rest. In contrast, the middle-sized Faculty of Social Sciences was divided between seven different panels, while the two large Faculties of Arts and of Sciences were covered by six panels each. It might be claimed that in these latter cases the total rating (and coefficient) for the Faculty may be more accurate and reliable, since it is an aggregate of so many different panels' ratings.

The departments had been asked to nominate at least one Finnish and two foreign eminent scholars for the panels in November 1998. The total number of nominations approached 450. From these, the Scientific Board selected 120 primary candidates and an equal amount of reserve names. This preliminary list was sent to the Faculties on 8 December 98. Subsequently, 17 % of the primary candidates were changed in the light of recommendations from the Faculties. The first invitations were sent in early January 99, and the membership of most panels was established by early March. In all, about 75 % of the primary candidates accepted the invitation. The last panel member was not confirmed until early June. (See Annex D for panel membership.) The panel chairs were chosen by the panels themselves.

The Scientific Board tried to ensure that every panel included at least one member who could read Finnish. Otherwise, there was no attempt to achieve any predetermined balance of nationalities in the panels. Their distribution thus mainly reflects the nominations made by the departments: 24 % of the evaluators were Finns, 22 % Swedes, 14 % Germans, 11 % Britons, 7 % Americans, 5 % Dutch, 6 % other Scandinavians, 8 % other Europeans, and 3 % came from other countries outside Europe. Only 10 % of the evaluators were women. Of the Finnish evaluators, the proportion was 20 %, which reflects closely the share of women in all professorial chairs in Finland. The female contingent was more substantial in the humanities panels than in the natural sciences.

The smallest panel had only two evaluators (Public Health), and the largest had nine members (Languages, and the heterogeneous panel of Asian and African Studies,

Classics, and Cultural Research). This was determined by the number of departments and disciplines to be assessed by each panel. Theoretically, the ideal panel size may be around 5-7 persons. A larger panel would cover the field better but it would be more difficult to manage during the visit.

Material

The evaluation material that was collected from each department and sent to the panels consisted of 1) some statistics of staff and financial resources; 2) a select bibliography compiled by the department; 3) a full bibliography taken from the University JULKI database; and 4) short project descriptions. The period covered in each category was 1994-98. What the panels most often complained to be lacking from the written material was short presentations on the assessed units' strategic plans. Fortunately, the plans and similar issues could be discussed during the site visits.

Department chairs were responsible for gathering the material in January 1999. As the time allowed for preparing the materials was minimal (one month), the submission deadline was extended by several weeks for some large departments. The guidelines sent to the departments seem to have been fairly clear, since the materials were almost without exception submitted in the prescribed form.

As a basis for the evaluation, all departments drew up a list of their research active staff for the period 1994-98. The list automatically included some specific categories of staff (e.g. all professors, senior assistants, postdoctoral research fellows). From other categories (e.g. full-time teachers and lecturers, junior assistants, postgraduate research fellows), the departments were free to choose those whose research output they wished to submit for the assessment. This freedom of choice was felt by some to be a potential source of ambiguity and to reduce the commensurability of the results. In practice, the varying circumstances and traditions of different disciplines seemed to warrant the liberty, which was actualized mainly in the case of postgraduate students. Probably some departments could have been more rigorous in their choice of submitted researchers, but the effect on ratings was negligible.

By far the most important part of the evaluation material was the select bibliography. The bibliography contained one work from each person listed as research active. In addition, the departments included a selection of their best works so that their number equalled the number of research active staff. Thus, the total size of the selected bibliography was normally twice the number of research active staff, and it reflected both the average quality of each unit's work and its best achievements. The same person could be included in the research active staff of several departments, if his or her position had changed during the evaluation period. The same work, however, could be listed only once, because departments were allowed to count as their output only publications which had appeared while the author belonged to their staff. In some rare cases the same publication had been submitted by two departments because there was confusion about the evaluation rules or the publication date. These and other minor inaccuracies were removed in full accord with the departments in question. There was no trace of deliberate misrepresentation.

This way of compiling the bibliography was generally considered well suited for the purposes of the assessment. It was a compromise between very different initial suggestions by the faculties, but it turned out to be successful. It highlighted the wish to measure the quality and not the quantity of each department's work, encouraging researchers to publish fewer but more substantial works. It was only in the panels for medicine that the evaluators considered two works per five years too small a sample to give a reliable picture of a department's quality, so they put more weight on the full bibliography when rating the departments.

The publications listed in the select bibliography were not automatically sent to the panels. The evaluators were advised to order from the departments as many publications as they wished to read before their site visit. It was expected that the panels would order only part of the works, and such indeed turned out to be the case. Some panels, especially in the humanities and social sciences, read the departments' output fairly extensively. All publications were on display during the site visits. In general, however, the departments felt that too little of their output had been seriously scrutinized. This tended in some cases to diminish the credibility of the Assessment. The panels, on the other hand, did not believe that a more systematic reading of the submitted material would have changed their evaluation of any unit.

Evaluation criteria

"Research" for the purpose of this evaluation was understood as original investigation undertaken in order to gain knowledge and understanding. It included works of direct relevance to the needs of culture and society. The panels were asked to base their ratings primarily on the submitted selected bibliography, but also on other submitted material, and on the impression they received during their site visit. This, however, was considered secondary for the ratings, giving the panels background information on the departments' work and influencing the ratings mainly when the panel hesitated between two grades. Among others, the following criteria were applied:

- originality, depth and breadth of past (1994-98) and ongoing research activity
- current importance of the research themes
- multidisciplinary and relevance for other research areas
- education and training of researchers (postgraduate and postdoctoral)
- interaction and collaboration with foreign researchers and research units

When drawing up the rating scale, the organizers started from the models used previously in the United Kingdom and in Portugal. They were, however, modified in many respects. The research activities of each assessed unit were rated according to the following scale:

- 7 *The majority of the submitted works are at a high international level and virtually all others at a good international level.*
- 6 *At least one third of the submitted works are at a high international level and many others at a good international level, these together comprising a clear majority.*

- 5 *The majority of the submitted works are at least at a good international level and virtually all others at a fair international level.*
- 4 *At least one third of the submitted works are at a good international level and many others at a fair international level, these together comprising a clear majority.*
- 3 *The majority of the submitted works are at least at a fair international level.*
- 2 *A minority of the submitted works are at a fair international level.*
- 1 *None, or virtually none, of the submitted works are at a fair international level.*

High, Good, and Fair international level were defined in the following way:

"High international level means work which is apt to arouse serious interest within international academic communities and which in principle, if offered, could be published by the leading international publishers or in the leading international journals with the most rigorous editorial standard (but irrespective of where it has actually been published)."

"Good international level means work which is of undisputed relevance for international academic communities and which could be published by well-known international publishers or in well-known international journals (but irrespective of where it has actually been published)."

"Fair international level means work which is of possible relevance for international academic communities and which has been published abroad or by well-known national publishers or in well-known national journals."

In addition, the panels were asked not to give one of the *two highest ratings (7 or 6)* unless they believed that the assessed department had to be ranked among the qualitatively best 10 % (rating 7) or 25 % (rating 6) European departments in its field of academic research. It should be pointed out that, in some cases, the primary rating scale, based on inherent publication quality and in comparison with other European departments, could lead to totally different ratings for the unit. When such was the case, the more rigorous criteria were applied. The implications of this remain to be considered when the next evaluation is prepared.

The panels were not asked to compare any unit with the national level in its own field. This would have been impossible for a panel consisting of foreign experts, especially as they could not be supplied with comparable evidence from other Finnish Universities. In most cases, the international level was seen as the most natural and impartial standard of comparison. In some cases, however, it was difficult to define, notably when assessing studies with a national basis. The organizers were aware that in many fields of research much work of high quality could be done which, because of its subject matter,

might not arouse active interest outside Finland. Although these studies might not be published by leading international publishers, they could still provide evidence of international excellence if they could be compared favourably with similar studies in other countries. Thus, research on Finnish law was to be compared with e.g. research on German law in a German university, or a department of Finnish language with a department of French in France or a department of Swedish in Sweden. However, if a department failed to produce any serious work with a wider international interest, the panels were asked to consider carefully the reasons for that and were advised to take it into account in determining the rating for the unit. (The Guidelines for Evaluation, with some further details, are presented in Annex E).

Site visits

Every panel visited the University for a period which ranged from two to six days. Typically, a middle-sized department was visited for half a day (3-4 hours), a few large departments for nearly two days. A site visit included brief presentations by the department chair and individual scholars, an interview with postgraduate students, and ample time for the panel's questions and discussion. Some panels also visited laboratories and even field stations outside Helsinki. In general, the panels found the site visits extremely useful and indeed indispensable for a proper evaluation of a unit's work. It did not affect the ratings as much as the recommendations made by the panels.

Given the very tight schedule of the Exercise, there were certain practical problems in finding a suitable time for each panel's visit. In some cases, the panel could not meet in Helsinki at the same time, and one or two members had to visit the University before the others. Apart from that, most panels felt that they would have needed more time for the visits and for their internal discussions. They used the evenings and the last day of the visit to write the reports on each assessed department. Often they could finish the reports during their stay, otherwise they completed the texts afterwards, usually within a couple of weeks. The exact working methods very much depended on the strategy adopted by the panel's chairperson. One or two extra days would often have made the task easier, but it was impossible to lengthen the visit. As long as the panels are composed of active eminent scholars, this problem can never be solved.

Reports

In addition to the numerical rating, the panels were asked to discuss in a written report of each assessed unit a number of questions, and to make recommendations as to how the unit could improve its performance in the near future (Annexes F and G). The report was further expected to explain how the panel had adapted the rating criteria, and the concrete reasons for the chosen rating. The length of the report naturally varied according to the size of the assessed unit, but the recommended average was about two pages.

Although the panels were advised to avoid naming individuals in the report, they were encouraged to distinguish, as much as possible, between sub-areas of research activity within the unit. This was particularly important when a department was large and/or consisted of heterogeneous smaller units (laboratories, individual disciplines). In practice, this turned out to be a problem for the panels, because it was often difficult to com-

ment on a department's performance without at least indirectly criticizing individuals who were easily recognizable. Perhaps for this reason, the reports were not always as clear as had been hoped for, and some departments did not find sufficient justification for the given rating. In general, the style and contents of the reports varied considerably, and this fact might merit further attention when the next Exercise is being planned.

Results and consequences

The most critical task in the Helsinki RAE was to ensure that the ratings given by different panels were commensurate. This was recognized already when drafting the evaluation criteria (see above). The dilemma was particularly difficult to solve, because the panels were expected to work independently, keeping the ratings confidential until the last panels had finished their reports. Before the first site visits, the Finnish members of all panels were convened to discuss the evaluation criteria and rating scale. But this meeting, though by no means useless, hardly helped very much to harmonize the practical operation of the panels. Perhaps the most significant unifying element, apart from the evaluation guidelines themselves, was the presence of the Evaluation Officer and Planning Officer of the University at the panels' discussions. Though not directly influencing the individual ratings, they were able to convey a broad model of how other panels had interpreted the criteria.

In spite of such efforts, it is fairly clear that all individual ratings were not in perfect harmony. Within the panels there was little problem, as the members of a panel always tended to agree on the relative merits and weaknesses of the assessed units. Cases remained between the panels in which the ratings of one panel may have been generally one grade lower or higher than those of another panel assessing a related field. No panel can be said to have misinterpreted the criteria or the rating scale, but it would be impossible to compile so rigid guidelines that subjective interpretations were totally excluded; and it is inevitable that in doubtful cases panels may sometimes choose to round the ratings up, sometimes down.

The last panel submitted its report on 2 October 1999, which meant that one month remained for the final analysis and processing of the results. The results were published on 4 October and aroused considerable interest, both within the University and outside it (Annexes C and H). Department chairs had seen the reports a short time before so that factual errors or inaccuracies could be removed. On 13 October there was a general open discussion chaired by Vice Rector Niiniluoto and attended by about 400 faculty members from all over the University. The participants suggested a number of improvements for the next Exercise, but the overall concept of the evaluation was not called into question. The organizers requested and received written comments, too, both from the assessed units and from the panel members.

On 13-14 October and 18 October the Scientific Board reviewed all the ratings and reports, discussing especially the possibility that variation in the panels' rating principles might have made the results too incompatible to be used for the purposes of resource allocation. The Board concluded that, although the ratings of individual units were not perfectly in line, the variation was so evenly distributed across the faculties that no faculty was significantly advantaged or disadvantaged. Thus, the Scientific Board calculated for each faculty an aggregate rating, formed from department ratings weighted with the

size of their research active staff. The lowest faculty rating was 4.5 and the highest 5.8. Subsequently, each faculty was given a coefficient between 0.80 and 1.08, which affected a part of their funding, according to the University allocation model (Annexes H and I). The Rector confirmed the coefficients on 22 October 1999, a year and a day after the Senate's decision which launched the Research Assessment Exercise.

The maximum effect of the coefficients was a seven percent decrease of basic funding for the faculty which had got the lowest rating. In all, some ten million FIM per year will be transferred for the next five years from the five faculties with ratings 4.5-5.1 to the four faculties with ratings 5.7-5.8. The total amount divided between faculties was about 700 million FIM. So although the financial consequences of the evaluation were not negligible, they were not particularly drastic. The faculties were free to use the results of the evaluation when they, in turn, allocated funds to individual departments. Most faculties did this in some way, but the maximum effect was again only a few percent of a unit's basic funding. So far it is not clear to what extent the departments will be able to follow the recommendations given by the panels. The Scientific Board will later examine more carefully the financial and intellectual consequences of the Exercise.

Dr Antti Arjava
Evaluation Officer

ANNEX A, PROJECT SCHEDULE

21.10.1998	The University Senate approved the total plan for the assessment of research.
Feb/Apr 1999	The Rector appoints the panel members
April 1999	Materials and guidelines sent to the panel members
Apr/June 1999	14 Panels visit the university for 2 – 6 days
Aug/Sep 1999	10 Panels visit the university
Oct 1999	Hearings for the departments/institutes and the faculties
22.10.1999	The Rector's decisions concerning funding
Dec 1999	Final report on the exercise

ANNEX B, PERSONS INVOLVED IN THE PLANNING AND MANAGEMENT

SCIENTIFIC BOARD OF THE UNIVERSITY OF HELSINKI

Vice-Rector Ilkka Niiniluoto, Chair

Professor Risto Eräsaari, Department of Social Policy
Professor Antti Kupiainen, Department of Mathematics
Professor Lars-Axel Lindberg, Department of Basic Veterinary Medicine
Professor Eeva Martikainen, Department of Systematic Theology
Professor Hannele Niemi, Department of Education
Professor Kevät Nousiainen, Department of Criminal Law, Judicial Procedure and General Jurisprudential Studies
Docent Arja Pennanen, Department of Plant Biology
Professor Eero Puolanne, Department of Food Technology
Professor Annamari Ranki, Department of Clinical Medicine
Professor Marja-Liisa Riekkola, Department of Medicine
Professor Mart Saarma, Institute of Biotechnology
Professor Anna-Leena Siikala, Department of Cultural Studies
MA Veijo Åberg, Department of History

Planning Officer Esa Hämäläinen, Secretary

GROUP DRAFTING THE PLAN FOR THE EXERCISE

Vice-Rector Ilkka Niiniluoto, Chair

Academician Erik Allardt
Academician Olli Lehto
Chancellor Lauri Saxén
Professor Arto Mustajoki

Planning Officer Arto Halinen, Secretary

ORGANISING GROUP

Vice-Rector Ilkka Niiniluoto
Telephone +358-9-191 24150
E-mail Ilkka.Niiniluoto@Helsinki.fi

Dr. Antti Arjava, Evaluation Officer
Telephone +358-9-191 22169
E-mail Antti.Arjava@Helsinki.fi

Planning Officer Esa Hämäläinen
Telephone +358-9-191 23125
E-mail Esa.J.Hamalainen@Helsinki.fi

**STAFF IN THE ADMINISTRATION OFFICE
INVOLVED IN THE EXERCISE**

Evaluation Officer Antti Arjava
Planning Officer Esa Hämäläinen
Planning Officer Karin Hannukainen
Planning Secretary Hilla Salovaara
Department Secretary Tarja Parviainen
Department Secretary Catarina Ranta
Department Secretary Iris Sinervuo
Department Secretary Eija Mawby

ANNEX C, EVALUATION PANELS, DEPARTMENTS AND RATINGS

1 MATHEMATICS, COMPUTER STUDIES, AND STATISTICS

Department of Computer Science	7
Department of Mathematics	7
Department of Statistics	4
Rolf Nevanlinna Institute	6

2 PHYSICS AND ASTRONOMY

Dating Laboratory, Finnish Museum of Natural History	5
Department of Astronomy	6
Department of Physics	6
Helsinki Institute of Physics	6

3 CHEMISTRY

Department of Chemistry	6
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4 BIOLOGICAL SCIENCES

Botanical Museum, Finnish Museum of Natural History	3
Department of Biosciences	5
Department of Ecological and Environmental Sciences	5
Department of Ecology and Systematics	5
Department of Limnology and Environmental Protection	4
Institute of Biotechnology	7
Zoological Museum, Finnish Museum of Natural History	4
Institute of Medical Technology, U. of Tampere	(7)
Biological Stations of the Faculty of Science (no rating)	

5 GEOLOGY, METEOROLOGY, AND GEOGRAPHY

Department of Geography	4
Department of Geology	6
Department of Geophysics	7
Department of Meteorology	7
Geological Museum, Finnish Museum of Natural History	5
Institute of Seismology	6

6 PRE-CLINICAL MEDICINE

Department of Forensic Medicine	6
Haartman-institute	
- Department of Bacteriology and Immunology	5
- Department of Virology	6
- Department of Pathology	6
- Department of Medical Genetics	7
- Transplantation Laboratory	5
Institute of Biomedicine	
- Department of Anatomy	5
- Department of Pharmacology and Toxicology	4
- Department of Physiology	6
- Department of Medical Chemistry	5

7 CLINICAL MEDICINE AND DENTISTRY

Institute of Clinical Medicine	
- Diagnostic-Therapeutic Department	6
- Department of Dermatology and Venereology	6
- Department of Surgery	5
- Hospital for Children and Adolescents	6
- Department of Obstetrics and Gynaecology	6
- Department of Neurosciences	6
- Department of Psychiatry	5
- Department of Ophthalmology and Otorhinolaryngology	5
- Department of Medicine	6
- Department of Oncology	5
- Department of General Practice and Primary Health Care	3
Institute of Dentistry	6

8 PUBLIC HEALTH

Department of Public Health	7
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9 PHARMACY	
Department of Pharmacy	4
10 VETERINARY SCIENCE	
Department of Basic Veterinary Sciences	4
Department of Clinical Veterinary Sciences	4
Department of Food and Environmental Hygiene	6
11 AGRICULTURAL SCIENCES AND FOOD SCIENCE	
Department of Agricultural Engineering and Household Technology	2
Department of Animal Science	4
Department of Applied Chemistry and Microbiology	6
Department of Food Technology	5
Department of Plant Biology	3
Department of Plant Production	4
12 FORESTRY	
Department of Applied Zoology	5
Department of Forest Ecology	7
Department of Forest Resource Management	6
13 ECONOMICS	
Department of Economics	6
Department of Economics and Management	3
Department of Forest Economics	4
Institute of Cooperative Studies	1
14 LAW	
Department of Criminal Law and Judicial Procedure	5
Department of General Jurisprudential Studies	5
Department of Private Law	5
Department of Public Law	5
Institute of International Economic Law	4
15 SOCIAL SCIENCES	
Department of Social Policy	5
Department of Social Psychology	6
Department of Sociology	
- General Sociology and Demography	6
Institute of Development Studies	4
Swedish School of Social Science	
- Social Science	4
16 PSYCHOLOGY	
Department of Psychology	7
17 EDUCATION	
Department of Education	5
Department of Teacher Education	5
18 POLITICS AND COMMUNICATION STUDIES	
Department of Communication	3
Department of Political Science	4
Swedish School of Social Science	
- Politics and Communication Studies	3
19 PHILOSOPHY	
Department of Philosophy	7
Department of Social and Moral Philosophy	7
20 LANGUAGES	
Department of English	7
Department of Finnish	7
Department of Finno-Ugrian studies	4
Department of General Linguistics	5
Department of German	4
Department of Phonetics	4
Department of Romance Languages	3
Department of Scandinavian Languages and Literature	
- Scandinavian Languages	6
Department of Slavonic and Baltic Languages and Literatures	6
Department of Translation Studies	2

21 ART RESEARCH

Institute for Art Research	
- Aesthetics	6
- Art History	5
- Comparative Literature	5
- Finnish Literature	4
- Musicology	7
- Theatre Research	3
Department of Scandinavian Languages and Literature	
- Nordic Literature	3

22 THEOLOGY

Department of Biblical Studies	7
Department of Church History	5
Department of Orthodoxy and East European Church Studies	5
Department of Practical Theology	5
Department of Systematic Theology	7

23 HISTORY

Department of History	5
Department of Social Science History	
- Political History	6
- Social and Economic History	5
Renvall Institute for Area and Cultural Studies	5

24 ASIAN AND AFRICAN STUDIES, CLASSICS, CULTURAL RESEARCH

Department of Classical Philology	7
Department of Comparative Religion	5
Institute for Cultural Research	
- Archaeology	5
- Ethnology	5
- Folklore	6
- Cultural Anthropology	5
Department of Sociology	
- Social Anthropology	7
Institute for Asian and African Studies	
- African Studies, computer analysis	6

A separate report on WOMEN'S STUDIES at the University of Helsinki.

ANNEX D, PANEL MEMBERS

(1) Mathematics, Computer Studies, and Statistics

Professor Stefan Arnborg, Royal Institute of Technology, Stockholm, Sweden
Professor Peter Naeve, Universität Bielefeldt, Germany
Professor Mats Rudemo, Chalmers Technical University, Göteborg, Sweden
Academy professor Arto Salomaa, University of Turku, Finland
Professor Kjell-Ove Widman, Mittag-Leffler-Institut, Djursholm, Sweden (Chair)

(2) Physics and Astronomy

Professor Michael Grewing, Institut de RadioAstronomie Millimétrique, Grenoble, France
Professor Walter F. Henning, Argonne National Laboratory, Illinois, USA
Professor Heinrich Leutwyler, University of Bern, Switzerland
Professor Gerhard Materlik, Deutsches Elektronen-Synchrotron, Hamburg, Germany (Chair)
Professor Jussi Timonen University of Jyväskylä, Finland
Professor M.J.A. de Voigt. Eindhoven University of Technology, The Netherlands

(3) Chemistry

Professor Kiyokatsu Jinno, Toyohashi University of Technology
Professor Sir Harold Kroto, University of Sussex. United Kingdom
Professor Torbjörn Norin, Royal Institute of Technology, Stockholm, Sweden (Chair)
Professor Tapani Pakkanen, University of Joensuu, Finland

(4) Biological Sciences

Professor Christer Erséus, Swedish Museum of Natural History, Stockholm, Sweden
Professor Paul Giller, University College Cork, Ireland
Professor Carl-Henrik Heldin, Uppsala University, Sweden
Professor Éva Hideg, Kyoto University, Japan
Professor Charles G. Kurland, Uppsala University, Sweden
Professor Pirjo Helena Mäkelä, National Public Health Institute, Helsinki, Finland
Professor Brian Moss, University of Liverpool, United Kingdom (Chair)

(5) Geology, Meteorology, and Geography

Professor emeritus Jan Lundqvist, Stockholm University, Sweden
Professor emeritus Mauri Palomäki, University of Vaasa, Finland
Professor emeritus Hilding Sundqvist, Stockholm University, Sweden

Professor Peter Wadhams, Scott Polar Research Institute, Cambridge, United Kingdom
Professor Brian F. Windley, University of Leicester, United Kingdom (Chair)

(6) Pre-Clinical Medicine

Professor Bernd Brinkmann, Westfälische Wilhelms-Universität Münster, Germany
Professor Bertil Fredholm, Karolinska Institutet, Stockholm, Sweden
Professor Erkki Ruoslahti, The Burnham Institute, California, USA (Chair)
Professor H. Kalervo Väänänen, University of Turku, Finland
Professor Hans Wigzell, Karolinska Institutet, Stockholm, Sweden

(7) Clinical Medicine and Dentistry

Professor Ralf Pettersson, Karolinska Institutet, Stockholm, Sweden (Chair)
Professor Folke Sjöqvist, Karolinska Institutet, Huddinge, Sweden
Professor Thomas Luger, Westfälische Wilhelms-Universität Münster, Germany
Professor Anders Linde, Göteborg University, Sweden
Professor Oddmund Søvik, Haukeland University Hospital, Bergen, Norway
Professor Lars Hamberger, Stockholm University, Sahlgrenska Sjukhuset, Sweden
Professor Ulf Haglund, Uppsala University, Sweden
Professor J. Donald Easton, Brown University, Providence, RI, USA

(8) Public Health

Director General Jussi Huttunen, National Public Health Institute, Helsinki, Finland
Professor Martin McKee, London School of Hygiene and Tropical Medicine, London, United Kingdom (Chair)

(9) Pharmacy

Professor Jukka Gynther, University of Kuopio, Finland
Professor Henning Kristensen, The Royal Danish School of Pharmacy, Copenhagen, Denmark (Chair)
Professor Lennart Paalzow, Uppsala University, Sweden

(10) Veterinary Science

Professor W.R. Allen, TBA, Suffolk, United Kingdom
Dr. P. David Eckersall, University of Glasgow, United Kingdom
Professor Jan Luthman, Swedish University of Agricultural Sciences, Uppsala, Sweden
Professor Esko Nurmi, National Veterinary and Food Research Institute, Helsinki, Finland (Chair)
Professor Frans Smulders, Veterinärmedizinische Universität Wien, Austria

(11) Agricultural Sciences and Food Science

Professor Johan van Arendonk, Wageningen Agricultural University, The Netherlands
Academy professor Eva-Mari Aro, University of Turku, Finland
Professor Wim Harder, TNO Institute of Environmental Sciences, The Netherlands
Professor Aarne Kurppa, Agricultural Research Centre of Finland, Jokioinen, Finland
Professor John Mitchell, University of Nottingham, United Kingdom (Chair)
Professor Nils Möller, Swedish University of Agricultural Sciences, Uppsala, Sweden
Professor Hans Steinhart, Universität Hamburg, Germany

(12) Forestry

Professor Gero Becker, Universität Freiburg, Germany
Professor John C. Gordon, Yale University, Connecticut, USA (Chair)
Professor Bo Långström, Swedish University of Agricultural Sciences, Uppsala, Sweden
Professor Eero Paavilainen, Finnish Forest Research Institute, Vantaa, Finland

(13) Economics

Professor Torben Andersen, University of Aarhus, Denmark
Professor Tom Berglund, Swedish School of Economics and Business Administration, Helsinki, Finland (Chair)
Professor Gert Van Dijk, NCR, The Hague, The Netherlands
Professor Karl-Gustaf Löfgren, Umeå University, Sweden

(14) Law

Professor Nils Jareborg, Uppsala University, Sweden
Professor emeritus Antero Jyränki, University of Turku, Finland (Chair)
Professor Leena Kartio, University of Turku, Finland
Professor Neil MacCormick, University of Edinburgh, United Kingdom
Professor Wolfgang Mincke, Ahaus, Germany

(15) Social Sciences

Professor Willem Doise, Université de Genève, Switzerland
Professor Birgitta Nedelmann, Johannes Gutenberg-Universität Mainz, Germany
Rector Jorma Sipilä, University of Tampere, Finland (Chair)
Professor Göran Therborn, The Swedish Collegium for Advanced Study in the Social Sciences, Uppsala, Sweden

(16) Psychology

Professor Michel Denis, Centre National de la Recherche Scientifique, Université Paris-Sud, France

Professor Jan Strelau, University of Warsaw, Poland (Chair)
Professor Arne Öhman, Karolinska Institutet, Stockholm, Sweden

(17) Education

Professor Frank Achtenhagen, Georg August-Universität Göttingen, Germany (Chair)
Professor Henning Johansson, Luleå University of Technology, Sweden
Professor Ewald Terhart, Ruhr-Universität Bochum, Germany
Professor Leena Syrjälä, University of Oulu, Finland

(18) Politics and Communication Studies

Professor Dag Anckar, Åbo Akademi, Finland (Chair)
Professor Jan-Erik Lane, Université de Geneve, Switzerland
Professor Michael J. Shapiro, University of Hawaii, USA

(19) Philosophy

Professor Robert Audi, University of Nebraska, Lincoln, USA (Chair)
Professor Ruth Chadwick, Lancaster University, United Kingdom
Professor Veikko Rantala, University of Tampere, Finland

(20) Languages

Professor Lars-Gunnar Andersson, Göteborg University, Sweden
Professor Raimo Anttila, University of California Los Angeles, USA
Professor Graham Caie, University of Glasgow, United Kingdom (Chair)
Professor emeritus Efim Etkind, Potsdam, Germany
Dr. Lauri Karttunen, Xerox Research Center Europe, Meylan, France
Professor Florien Koopmans-van Beinum, University of Amsterdam, The Netherlands
Professor Lars-Gunnar Larsson, Uppsala University, Sweden
Professor Ilpo Piirainen, Westfälische Wilhelms-Universität Münster, Germany
Professor Jörgen Schmitt Jensen, University of Aarhus, Denmark

(21) Art Research

Professor Daniel Charles, Université de Nice Sophia Antapolis, France
Professor Michael Ann Holly, University of Rochester, New York, USA
Professor Irmeli Niemi, Sauvo, Finland (Chair)
Professor Roger D. Sell, Åbo Akademi University, Finland
Professor Richard Shusterman, Temple University, Philadelphia, USA

(22) Theology

Professor Svend Andersen, University of Aarhus, Denmark
Professor Jürgen Becker, Christian-Albrechts-Universität zu Kiel, Germany
Rector Gustav Björkstrand, Åbo Akademi, Finland (Chair)
Professor Hermann Michael Niemann, Universität Rostock, Germany

(23) History

Professor emeritus Jorma Ahvenainen, Kokemäki, Finland (Chair)
Professor Torkel Jansson, Uppsala University, Sweden
Professor Einar Niemi, The University of Tromsø, Norway
Professor Klaus Tenfelde, Ruhr-Universität Bochum, Germany
Professor Anthony F. Upton, University of Edinburgh, United Kingdom

(24) Asian and African Studies, Classics, Cultural Research

Professor emeritus Albrecht Dihle, Köln, Germany
Professor Dietz Otto Edzard, Ludwig-Maximilians-Universität München, Germany
Professor James Fox, Australian National University, Canberra, Australia (Chair)
Professor Tryggve Kronholm, Uppsala University, Sweden
Professor Konrad Köstlin, Universität Wien, Austria
Professor Victor H. Mair, University of Pennsylvania, USA
Professor Margaret Mills, The Ohio State University, USA
Professor Milton Nuñez, University of Oulu, Finland
Professor Håkan Rydving, Norwegian Academy of Science & Letters, Oslo, Norway

WOMEN'S STUDIES

Professor Marja-Liisa Honkasalo, Nordic School of Public Health, Göteborg, Sweden

ANNEX E, GUIDELINES FOR EVALUATION

EVIDENCE AND CRITERIA FOR ASSESSMENT

The basic unit to be assessed and to receive a numerical rating is a department. All departments have drawn up a list of their research active staff for the period 1994-98. The list includes automatically some categories of staff (e.g. all professors, senior assistants, postdoctoral research fellows). From some other categories (e.g. full-time teachers and lecturers, junior assistants, postgraduate research fellows) the departments have been free to choose those whose research output they wished to submit for the assessment.

Each department has compiled a select bibliography of its most important research output between 1994-98. The bibliography contains *one work from each person listed as research active*. In addition, the department has included a *selection of its best works* so that their number equals the number of research active staff. Thus, the total size of the selected bibliography is normally twice the number of research active staff. In this way it reflects both the average quality of each unit's work and its best achievements. In principle, the panels will consider the work of a department as a whole to reach a view as to its overall quality profile. However, they should also compare the bibliography with the list of research active staff in order not to overlook the presence of staff who have been employed for several years during the assessment period but whose current individual output is unimpressive.

"Research" for the purpose of this evaluation is to be understood as original investigation undertaken in order to gain knowledge and understanding. It includes work of direct relevance to the needs of culture and society. The panels should base their ratings primarily on the submitted selected bibliography, but also on other submitted material, and on the impression they receive during their site visit. Among others, the following criteria should be applied:

- originality, depth, and breadth of past (1994-98) and ongoing research activity
- current importance of the research themes
- multidisciplinary and relevance for other research areas
- education and training of researchers (postgraduate and postdoctoral)
- interaction and collaboration with foreign researchers and research units

RATING SCALE AND DESCRIPTIONS

The research activities of each assessed unit should be rated according to the following scale:

- 7 *The majority of the submitted works are at a high international level and virtually all others at a good international level.*
- 6 *At least one third of the submitted works are at a high international level and many others at a good international level, these together comprising a clear majority.*
- 5 *The majority of the submitted works are at least at a good international level and virtually all others at a fair international level.*

- 4 *At least one third of the submitted works are at a good international level and many others at a fair international level, these together comprising a clear majority.*
- 3 *The majority of the submitted works are at least at a fair international level.*
- 2 *A minority of the submitted works are at a fair international level.*
- 1 *None, or virtually none, of the submitted works are at a fair international level.*

High international level means work which is apt to arouse serious interest within international academic communities and which in principle could, if offered, be published by the leading international publishers or in the leading international journals with the most rigorous editorial standard (but irrespective of where it has actually been published).

Good international level means work which is of undisputed relevance for international academic communities and which could be published by well-known international publishers or in well-known international journals (but irrespective of where it has actually been published).

Fair international level means work which is of possible relevance for international academic communities and which has been published abroad or by well-known national publishers or in well-known national journals.

The panels should not give one of the two highest ratings (7 or 6) unless they believe that the assessed department has to be ranked among the qualitatively best 10 % (rating 7) or 25 % (rating 6) European departments in its field of academic research.

The ratings refer to an absolute standard of quality in each department. They should be related only to *the size of the research active staff*, but independent of the conditions for research (such as teaching load or funding) within individual departments. The presence of a high proportion of young or recently established researchers may, for example, explain why the average output of a department remains below expectation. The panels are invited to record such special circumstances in their written report, but they *should not have an effect upon the rating*.

For the purposes of the above definitions "international journal" refers to a journal whose main audience is an international academic community, irrespective of the country where it has been published. "National journal" refers to a journal whose main audience is the Finnish academic community. In principle, the media where the output of a unit has been published should not have an effect upon its rating, because the rating scale is based on *the inherent quality of the output*. However, the panels should mention in their written statement if they believe that the work of an assessed unit is regularly published in a way which does not favour a genuine dissemination of ideas.

STUDIES WITH A NATIONAL BASIS

High international level refers to a level that is reasonable to expect for the unit. This may

sometimes be difficult to define, especially when assessing studies with a national basis. *In the absence of current examples, standards in cognate research areas where international comparisons do exist will need to be adopted.* Thus, research on Finnish law should be compared with e.g. research on German law in a German university, or a department of Finnish language with a department of French in France or a department of Swedish in Sweden.

The panels will be aware that in some fields of research much work of high quality can be done which, because of its subject matter, may not arouse active interest outside Finland. In many cases it is not feasible to publish the results of such research in languages other than Finnish or Swedish. Although these studies might not be published by leading international publishers, they may still provide evidence of international excellence *if they can be compared favourably with similar studies in other countries.* Thus, the choice of a nationally justified topic *should not have a negative effect upon the rating.* However, if a department fails to produce any serious work with a wider international interest the panel is asked to consider carefully the reasons for that and *may take it into account in determining the rating for the unit.* In case the limited international interest in a particular output is due to a real lack of depth and originality, it should have a detrimental effect upon the rating.

ADDITIONAL QUESTIONS TO BE DISCUSSED

In addition to the numerical rating, the panels are asked to discuss in their written report of each assessed unit the following questions (when applicable):

1. The particular strengths and weaknesses of the unit. The panels should distinguish, as much as possible, between sub-areas of research activity within the unit. This is particularly important when a department is large and/or consists of heterogeneous smaller units (laboratories, individual disciplines).
2. Adequacy of resources (personnel, libraries, equipment, technical support, funding) for the research and efficiency in their use.
3. Special reasons why the unit has not been more productive during the assessment period and/or suggestions how the unit could improve the quality of its research.
4. The success of the unit in publishing the results of its work. (How active are the staff in publishing their results? Have the best possible publishing channels been used? Are the researchers and their work widely known among colleagues?).
5. The panels have been asked to adopt an international perspective in rating the research activity of all the departments (see above). Would the adoption of a different (national) perspective change the evaluation of the assessed unit? The existence of very different scientific traditions within the field may also make it difficult to determine who exactly is the international academic audience. The panel may here state if it feels that the rating has been particularly problematic in this respect.

ANNEX F, REPORT OF THE PANEL 4. BIOLOGICAL SCIENCES

General Introduction

Biological Sciences now constitute a very large area ranging from studies of molecules on the one hand to global systems on the other. The University of Helsinki's investment in biological sciences covers most of this range. It is located in three faculties, Science, Agriculture and Forestry, and Pre-Clinical Medicine. The latter has been assessed by a separate panel as also have most biology-based departments in the Faculty of Agriculture. The exception was the Dept. of Limnology & Environmental Protection, which Panel 4 considered along with the Botanical & Zoological Departments of the Finnish Museum of Natural History, the Dept. of Biosciences, the Institute of Biotechnology, the Dept. of Ecology & Systematics, the Dept. of Ecological & Environmental Sciences (at Lahti) & the three Biological Stations of the Faculty of Science. Profs. Erseus, Giller, Hideg, Makela & Moss (who acted as chairperson) were available in the week of Sept. 6-10 and visited parts of all the listed units. Prof. Makela (who acted then as Chairperson), Kurland & Heldin were available on Sept. 13 & 14 when they visited the remaining parts of the Dept. of Biosciences & Institute of Biotechnology and the Institute of Medical Technology, University of Tampere.

The panel closely followed the guidelines of the University in rating the Departments and Institute on the basis of the selected publications given for each active researcher. It used the terms "high, good & fair international" terminology, established by the University & defined 'high' as meaning papers published in what the panel considered the leading 25% of journals in the appropriate sub-discipline. It considered 'good' status to include the middle 50% of journals and 'fair' to be the remaining 25% of international journals. Publications of national significance were taken to be those generally unavailable, through language or obscure publication status to international audiences. Where publications were listed on a divisional basis within a department, the panel rated the division separately & then calculated the departmental mean, weighted according to the number of research-active staff presented in each division.

There was some concern about the applicability of these categories to the museum departments and the systematics division of the Dept of Ecology and Systematics. The opportunities for publication in some areas of systematics-based research are limited by the paucity of high impact journals because systematics is largely served by a plethora of highly specific journals, each with a very specialised audience, although the results of this research, ultimately reflected in the accurate taxonomy necessary for all other biological research, are of cosmopolitan importance. On the University's scheme, to which we have abided, most systematics journals would rate inevitably only as 'fair' and this perhaps underestimates the significance of much of this work.

The panel paid little attention to research income, for some areas are inherently more expensive than others but it did note major research grants & contracts from competitive sources. Nor did it pay very much attention to the lengths of the total publications lists, for these were highly miscellaneous and could have included much repetition, in conference or semi-popular form, of work also published in research journals. The panel

did, however, compare the nature of the selected & total lists to determine the extent to which the selected list was typical of the total output.

Journal impact factors were barely considered as their absolute value is determined more by the size of the constituency & the number of papers published annually in a journal than by absolute quality. The panel, however, was aware of the status of journals among sub-disciplines, which it considered was reflected in the relative values of the impact factors among that group.

Visits to the Departments & Institutes were very helpful, not so much in determining the ratings, but in establishing the background that might have contributed to the rating given. In all cases the departments were asked for their comments on the system the University had established and in all cases they felt the scheme acceptable. In almost all cases (the exceptions being the museum departments), the graduate students were met in the absence of the staff and their views solicited on the research environment. These often proved illuminating. We are very grateful for all the help we were given, the hospitality received from the Departments and Institutes and the Rector and the admirable logistic arrangements made by Dr Antti Arjava & Mr Esa Hamalainen and not least the stimulating intellectual discussions on the role of women in ancient Rome we had with Dr Arjava whilst in transit between Helsinki, Lahti & Lammi.

We would urge that this report be read through in its entirety, and not just selectively for individual departments. for there are general issues of organisation, particularly of biological environmental sciences and of systematics in the University that we allude to in a number of places and draw together at the end in our discussion of the Biological Stations.

Department of Limnology and Environmental Protection

Rating: 4

Brief description

The Department lies in the Faculty of Agriculture and Forestry and is situated in buildings at the Viikki campus. It comprises three sub-units, Fishery Science, Limnology and Environmental Protection Science, the latter two, each with a permanent Professor, the former yet lacking a permanent position. The headship circulates among the three professors and presently is held by the (temporary) Professor in Fishery Science. The Professor of Environmental Protection Science joined the University only two years ago.

The research carried out is broadly congruent in fishery science & limnology, using traditional techniques but includes strong elements of policy studies in environmental protection. For the period 1994-1998, between 13 and 19 research active persons were listed.

Major projects in fishery science include studies on fish survival, embryonic development, reproduction, population dynamics, competition & predation, largely on freshwater species. The unit sees its strengths in the traditional and well-tested fisheries approaches of trophic level interaction, species interaction, fish recruitment and fish stock assessment. These are substantial externally funded projects on factors influencing the recruitment of freshwater fish species (funded by the Govt. of Åland, Fisheries Association of Tuusula & others), on the effects European Structural Funds on the Finnish fishing industry (Ministry of Agriculture & Forestry) and population dynamics of pike perch (Academy of Finland).

Limnological research in the Department covers biomanipulation and bacteria-phytoplankton relationships, nutrient dynamics between sediment and water and the monitoring of stream water quality using specific groups of algae. Examples of externally funded projects include Nutrient and Plankton Dynamics in the Baltic Sea (European Union) and Biomanipulation in Lakes (European Union). The latter is part of a larger consortium organised by the Finnish Fisheries & Game Research Institute.

Developed work in environmental protection focuses on heavy metals and hydrocarbons in the environment and fluxes of cadmium through managed forests and into lakes, on urban dust in the Helsinki area (funded by the Helsinki Metropolitan Area Council), and the conversion of sulphur and nitrogen air pollutants to usable fertiliser. It will also include recently introduced approaches to environmental history, ecological modernisation & environmental policy which funding has been applied for and currently includes policy work on traffic and climate change and the modelling of environmental problems.

Assessment of strengths and weaknesses

We were told that in the last decade the department had increased markedly in activity and scope and, when questioned in the absence of the staff, the graduate students enthusiastically confirmed this. They felt that there was a good collegiate environment, ready access to supervisors and considerable co-operation. These are helped by the need for mutual help in field-based activities and the relatively small size of the department. The staff have a strong commitment to teaching, which provides a flow of good graduate students and have clear expertise in their areas of stated specialisation. The appointment of the Professor of Environmental Protection bodes well for new policy approaches to complement the existing empirical science.

However, we also felt that much of the work rested too much in traditional descriptive and monitoring approaches at a time when experimental work is greatly improving understanding of freshwater systems and that there was yet little sign of cross-fertilisation between the fisheries and limnology sections on the one hand and environmental protection on the other. The present location of these groups in separate buildings clearly hinders this but we were not convinced that the future relocation of the whole department into one building would alone resolve the matter.

We were also concerned at a degree of complacency in coping with the operation of the department at a time when opportunities for change and improvement are arising. This is partly a function of the scattering of environmental sciences over too large a number of departments and over two faculties and we discuss this issue in our report on the Biological Stations, but although the department sees itself as a reasonably seaworthy self-contained vessel of traditional design, this may not be the best transport for the future. In its defence, however, we were assured that amalgamation with, for example the Hydrobiology division of the Dept of Ecology and Systematics would be welcomed.

There was no strategic plan for the future development of research, and no major evidence of the department functioning as a unit rather than as a collection of two or three sub-units. Perhaps symptomatic of this was the complaint by both staff and students that laboratory (as opposed to field) equipment and facilities were often outdated; there was no department-wide policy to remedy this situation.

It appeared that the Department was under-valued in the Faculty of Agriculture & Forestry and indeed this may not be the most appropriate location for it; we were told that it had been encouraged to move into more applied areas such as aquaculture but we do not believe that this would be in the interests of a policy of encouraging cutting-edge research in the University.

Justification for rating

In our view over a third of the submitted works were at good international level and we could find many others at the fair level. The ambition of the department, however, had not risen to publication in very competitive journals such as *Limnology and Oceanography*, *Journal of Animal Ecology* or *Freshwater Biology*. There was a tendency to choose journals of limited scope, which, though of very good quality, do not reach an audience outside a particular specialisation. Our assessment of the complete bibliography confirmed this view, with about half of the publications debarred by language or obscurity of publication from a wide audience.

Recommendations

Our recommendations fall into two categories. First, we believe the department, as it is presently constituted, needs to develop a strong strategy for the future, capitalising on its high morale to assert itself both in the Faculty and in international publication. It needs to develop systems of review, policies for publication and for replacement of equipment.

Secondly, it would be in the department's interest to take part in a review of the scope of environmental sciences at the University of Helsinki. Freshwater studies, for example are spread among three separate departments at present and although there are historical reasons for this, the current spread may limit the strength that could emerge from a different organisation. The position of environmental protection may also be sub-optimal. In our report on the Biological Stations, we have discussed some of these issues and that report should be read in conjunction with this. We would like to thank the department for its frank description of its current status which was very helpful to us in drawing our conclusions.

Department of Biosciences

Overall Rating: 5

Brief description of the Department

The department was formed in 1995 from five previously independent Departments (now Divisions of the Department) in the Faculty of Mathematics and Sciences. This reorganisation coincided with the move of most of the Department from previous widely scattered locations to the Viikki campus to form, together with some other Departments and the Institute of Biotechnology, the Viikki Biocenter. Amalgamation into a new common Department has understandably been slow, so that today there is a large amount of collaboration and synergy between some Divisions while the process is only beginning in some. The same is true of the move to Viikki: the Division of Animal Physiology has yet to be able to move.

The Department now consists of five Divisions, representing laboratory-based sub-disciplines of biology, other aspects of biology being the province of the Department of Ecology and Systematics which is not yet located in Viikki, although there are plans for

moving at least parts of it to there. The related disciplines of Chemistry, Physics and Mathematics are located separately from the two biological Departments.

Assessment of strengths and weaknesses

The formation of the Department of Biosciences and the moving of its components to one location in close proximity to each other has clearly been beneficial to its research in providing an environment stimulating to exchange of ideas and methods with a focus on laboratory biological sciences. The Department has benefited from the Biocenter concept as evidenced by increased collaboration between research groups in the Biocenter, adoption of new methodologies greatly facilitated by the availability of the core facilities offered by the Institute of Biotechnology, and joint research training activities.

Conversely the presence of the Department of Biosciences has already contributed to the Biocenter community at the molecular and cellular levels and, it is hoped, will endeavour to make similar contributions at the whole organisms and population levels in the future. An important strength associated to the move to Viikki is the new campus, with beautiful and functional modern buildings offering excellent opportunities for interaction across disciplinary boundaries not only for senior researchers but importantly also for the PhD students.

The Department offers very good graduate student programmes organized within several separately funded 'Graduate Schools'. The students clearly find the Biocenter a stimulating environment for research training and, with the exception of a few large research groups, feel that they receive good supervision and are accepted as proper members of the research team. A positive feature of the Department as a whole was also an interest in improvement and modernisation of undergraduate teaching in collaboration between Divisions. The panel sees this as an important prerequisite for the future recruitment of competent and enthusiastic PhD students and thus for future research in Biosciences.

At the same time the panel found shortcomings, some of which may, if not corrected, have a damaging effect on the future research in the Department. In spite of collaborative research projects, there is a general lack of coherence within the Department, which is formed of heterogeneous research groups without a common goal and motivation for e.g. creation of common policies. This may be largely due to an administrative structure that does not encourage the development of a departmental strategy concerning such matters as the strengthening of specific research areas, recruitment policies and the introduction of equipment for new and costly methodology, as well as for core facilities to support its activities.

The Department's current Divisions appear artificial, and should be replaced by more logistic and subject-orientated sections in the near future. We appreciate that this is the intention of the Department but that its intention is held back by a lack of unanimity among the Divisions as to future organisation. We would support the principle that organisation should reflect current needs rather than historical arrangements.

From an international perspective, it seems that we are currently witnessing a slow dissolution of the previously high boundaries between different biological disciplines. This is partly due to the incorporation of genetic, molecular and cellular techniques into almost all other biological disciplines. Whilst good in some ways, these tendencies entail the risk that some important disciplines may be weakened and eventually entirely disappear, with serious consequences for the future. A case in point in the present Department

seems to be that of Plant Physiology. This is an essential subject in its own right, as well as an important context for plant molecular biology. Nevertheless, the Division supports only one rather junior scientist within this important research area as its contribution to the Centre of Excellence on Plant and Molecular Biology and Forest Tree Biotechnology in the Biocenter.

The perspective of the whole organism and its function is essential for all research in biosciences. This perspective, which is needed to guide the selection of research and training is presently at risk in the Department, because it now focuses, in almost all of its research projects, on the molecular level. Molecular biology is still often a descriptive science, no matter how sophisticated the tools of description. The problem is likely to increase, through its effects on undergraduate teaching, without specific planning to mitigate it.

Graduate students find the Department an attractive research environment and feel that enhanced reputation is given to the scientific achievements of their particular Division. Frequent seminars and lectures from invited scientists provide a good forum for the exchange of information. The vast majority of students feel that they are accepted as equal members of a science team. Although they unmistakably benefit from being part of a successful group, we had the impression that some graduate students may not get enough attention due to the multiple scientific and administrative tasks of their supervisors. The Department may like to consider limiting the number of graduate students per supervisors and/or working out a supervision policy.

A separate problem seemed to be an uneven distribution of teaching duties - too much for some. Thus the teaching assistants, who at the same time must work on research for their thesis take 'forever' to finish their dissertations. In contrast, the knowledge and capabilities of those successfully pursuing pure research programmes are not available to enhance the quality of the teaching programme at the undergraduate level. The graduate school programmes have largely eliminated this problem on the graduate level, but it should not be forgotten that graduate programmes will dwindle if not fed by inspired undergraduates.

Justification of the rating

The Department rating is derived from the ratings of the divisions (shown in the separate reports below) by taking into account the size of the research active staff in them. In spite of differences between Divisions and research groups, overall a majority of the publications submitted for evaluation were of good international standard, published in good journals of the specific fields, with some of high international standard published in the most prestigious journals. However, in some Divisions there were also selected publications of only fair international standard. The majority of the research deals with important and timely topics, uses up-to-date methods and is internationally appreciated as a significant contribution to the current research effort in biological sciences.

Recommendations

The successful performance of the Department in the future requires a simplified, co-ordinated administrative organisation for the Department as a whole. In particular, the administrative head of the Department must be made responsible for coherent departmental strategies concerning long-term planning of research and training priorities, ex-

pansion into new areas, and the introduction of costly new methods as well as core facilities. An essential aspect of this planning/priority work must be recruitment policy. Here, the recruitment policies must include in addition to senior staff, postdoctoral and junior group leader positions. Obviously, both establishing priorities and implementing policies require that the Departmental head be invested with substantial power as well as be supported by an appropriate small advisory group.

With a common agreed policy the Department should prioritise the use of its resources, both human and material, to implement its plans, e.g. for establishment of needed core facilities and the agreed quality and quantity of teaching programmes. Joint planning with other partners in the Viikki Biocenter should further augment these possibilities.

Division of Animal Physiology

Division Rating: 5

Brief description

Currently the Division is located separately from the remaining components of the Biosciences Department. It is listed as having 36 researchers in 1998, largely dominated by the major group involved in neurophysiology. The research specialisation is in brain function and mechanisms, with some research in endocrine control of growth, vision and respiratory physiology, although these groups are relatively small. The main axis of collaboration within the University is with biomedical and biotechnological areas. The Division has considerable international co-operation and relatively good research income, but has indicated that a limiting resource lies in the lack of talented personnel and graduate students in the area.

Assessment of major strengths and weaknesses

The Division has a clear and internationally recognised expertise in neurobiology (brain function and mechanisms) with a high status postgraduate school and forms a major part of a Centre of Excellence in Neurobiology within the University. There is strong collaboration with international researchers in this area and collaboration with the Institute of Biotechnology. The Division has a good publication record, particularly in the neurobiology area. The multidisciplinary approach being adopted in the vision research area is encouraging.

The Division is however dominated by research a single area and its status is particularly related to the success of this group and the international recognition of the leading researcher. There is relatively modest research output in a limited range of other areas. We also express some concern about the level of co-operation amongst staff and research groups in the Division. The level and nature of postgraduate supervision appears to be quite variable within the Division.

Justification for Rating

Whilst there is considerable variation in the quality of research output amongst the various research groups in the Division, the overall rating is based on our assessment of the combined submitted publication list, full bibliography and breadth of research conducted in the Division.

Recommendations

We believe that the Division needs to be more forward-looking and not focus so greatly on just one research area, but seriously to consider broadening its range of research areas. In this respect a strengthening of links to environmental areas (whole organism and ecophysiology) should, in our opinion, be promoted. This may also help to overcome the apparent difficulty in attracting 'new blood' into the Division. Some internal evaluation of the degree and quality of postgraduate supervision may be beneficial.

Division of Biochemistry

Division Rating: 6

Brief description

An important theme in the Division is study of the interactions between cells and between cells and their environment, as well as the intracellular signalling that results from such interactions. Molecules involved in leukocyte adhesion and the signalling that results from ligation of such molecules are successfully studied, as well as the role of the heparin binding molecules HB-GAM and amphoterin in axonal growth and plasticity. Another group focuses on the structural and functional properties of glutamate receptors, and yet another one on the role of intracellular tyrosine kinases downstream of integrins and other plasma membrane receptors. There is also good knowledge in the Division of methods of studying intracellular transport events. An interesting and promising way of targeting tumours by use of specific peptides selected by phage display technique has also been explored. The Division is particularly strong in cell biological techniques, and has found a niche in which it can make good use of its impressive biochemical skills.

Assessment of strengths and weaknesses

The Division leader should be complimented on the structure of the Division, supporting a diverse set of subgroups and projects, yet preserving a coherence in the theme of research. The extensive collaborations between the groups are also positive. Among the strengths are also the steady flow of excellent publications in very good international journals with high visibility. The Division should also be congratulated on recent recruitment of staff bringing skills in large scale expression of proteins and structural analyses of proteins.

Concern was expressed regarding the difficulty in retaining a core of experienced teachers, since many of the staff are on leave-of-absence in the Institute of Biotechnology or elsewhere. There also appears to be an inequality in the teaching load among the young scientists; some are teaching so much that it hampers their scientific careers, yet some do not teach at all. Among the students concern was expressed about the scarce support in biocomputing and bioinformatics.

Justification for rating

This is an excellent Division. In general, the topics chosen to study are relevant and important, and the questions asked are interesting. Appropriate and up-to-date methods are chosen to achieve the scientific goals. Most of the publications are in good international journals with high visibility, with occasional papers in the very best journals. We find that the rating of a strong 6 is justified. With one or a few findings of break-through character, which may well come in the near future, a rating of 7 would be justified.

Recommendations

An obvious recommendation is to keep up the excellent work! It is, moreover, recommended that an emphasis on cell biological techniques be maintained, perhaps further complemented with genetic techniques. Possible ways of correcting the inequality in teaching loads for the staff should be considered.

Division of Plant Physiology

Division Rating: 4

Brief Description

Plant Physiology is a relatively small section among mostly larger divisions of the department. It consists of three groups studying diverse topics. Their integration into one unit appears artificial and suggests the need for rethinking the structural framework of both research and teaching within the department.

One group works on molecular genetics and studies the signal transduction in filamentous fungi. It focuses on the expression of a special set of genes that directly affect the cytoskeleton and control the interaction of these organisms with their environment during growth and mating. The second group has successfully applied somatic embryogenesis for reproducing woody plants that have low germinable seed production and has also introduced a special biotechnological technique for producing free lignin in cell culture solutions. The third sub-unit studies stress tolerance in higher plants: the events and consequences of plant membrane lipid damage during flooding and anoxia.

Assessment of strengths and weaknesses

We found that recently adopted research projects of the division have potential to integrate molecular biological and physiological approaches and are at a good international level. However, the evident success of collaborating on molecular level studies within the department itself and in surrounding research units seems to prompt the research policy of the division towards neglecting traditional plant physiology. In the long term, this may result in the disappearance of physiological research and that would undermine teaching the discipline at university level. The other potential danger of the present trend is the possibility of rendering plant physiology groups scientifically secondary and financially dependent on relatively short term molecular biology projects. There is a clear need within the Department of Biosciences for whole organism and ecophysiological approaches which are not currently being met.

Despite its scientific weaknesses, the Division of Plant Physiology is attractive to graduate students, who feel better supported and more connected to their supervisors than in some of the larger and more dynamic divisions of the same department. This atmosphere should be preserved and backed up by providing more inventive research topics.

Justification for Rating

About one third of publications from the division were published at good international level and many others in journals representing fair international level. Although some projects clearly show potential, the Division in its present status appears as a weakening sub-unit of the Department and has need of strengthening in terms of utilities, manpower and introduction of new research topics.

Recommendations

The Division needs support in order to be able to preserve plant physiology as a discipline in the Faculty of Science. To facilitate this, it needs support in terms of utilities, manpower and financial resources, as well as the modification of science policy.

We feel that in order to represent plant physiology better, the research strategy should focus on studies above molecular and cell level. More emphasis is needed on whole plant and plant organ studies. This requires new equipment, such as growth and incubation chambers and tools for bioproduction evaluation.

Young researchers should be encouraged to take up projects with more varied physiological approaches and the department should make an effort to preserve at least one of the two chairs as a plant physiology professorship.

Besides maintaining the division's presence in the plant molecular biology group of the Centre of Excellence, the department should encourage the participation of its plant physiology orientated groups, both within the present Division of Plant Physiology and in other divisions, to seek collaborations with plant ecology and bioenergetics projects.

Division of Genetics

Division Rating: 5

Brief Description

The majority of the Division's projects are concentrated on plant molecular biology. They study how various biotic and abiotic stress conditions activate a signal transduction pathway and activate the expression of specific genes that may have a role in stress tolerance. The planned programme on forest tree biotechnology is an area relevant to the Finnish economy, but it is yet at an early stage. Other projects in the division are on a smaller scale and appear somewhat isolated.

Assessment of strengths and weaknesses

The Division provides a stimulating environment which is reflected in the integration of the plant molecular biology groups of the Division in a Centre of Excellence. The research focusing on plants represents a good research strategy with clearly formulated project plans in a nationally important area. The group has good international connections, and an atmosphere of enthusiasm attractive to PhD students. On the other hand, the rapid expansion of this area and the large number of PhD students seems to have created some problems of space and availability of supervision. Moreover, we would like to express our concern that while serving as background for grant applications, the Division's functions as part of a university department suffer in the long-term. The overwhelming molecular approach in the plant research area may be a hindrance to further development of the research, which should expand from the molecules to the whole organism, and populations. This will most likely need more expertise in plant physiology and population biology.

The other current projects of the Division, while not without merit, are too isolated and small-scale to support a research tradition of high international status. The project on immunology of pregnancy, for example, has little to do with genetics. As a whole the division appeared to be losing its profile as representative of an important discipline in Biosciences, the consequences of which may be serious to the whole Department

Justification for Rating

The research and publications records of the different research groups within the division vary. Thus, whereas most of the publications submitted for evaluation were published in good international journals, with many in the best journals of the research field, there were several at a fair international level only. The research in the subject area of plant genetics is part of a Centre of Excellence on Plant Molecular Biology and Forest Tree Biotechnology at the Viikki Biocenter. However, while its projects and goals were well formulated and dealing with important subjects, their potential contribution to the research output remains to be seen.

Recommendations

The Division must reconsider its position and programme with a view on both the research and teaching of Genetics within the Department of Biosciences. Although the molecular biology goals of the research are well-defined and remarkable progress has already been made to achieve them, we feel that more emphasis is needed on aspects of work above the molecular level. More interaction between the Division of Genetics and other Divisions of the Department of Biosciences and with stress physiology orientated groups in the Faculty of Agriculture would certainly be beneficial.

Division of General Microbiology

Division Rating: 5

Brief description

The Division's research focuses on three major areas: structure and assembly of lipid-containing bacteriophages, mechanisms of pathogenicity of human pathogenic bacteria and microbial plant interactions. The research is carried out in established research groups of 10-20 researchers each. The work on bacteriophage structure is at the cutting edge of current research, and pursued in intimate collaboration with excellent research groups abroad. The work on human pathogens focuses on the mechanisms of adhesion and bacterial penetration through tissues. The plant-microbe interaction projects are more varied. The group working on plant pathogenic bacteria and stress responses is part of the Centre of Excellence of Plant Molecular Biology and Forest Tree Biotechnology. The projects on associations of mycorrhizal fungi and bacterial biofilms with roots of pine trees are of great interest to environmental research, but the major findings remain to be seen.

Assessment of strengths and weaknesses

The group working on bacteriophage structure is complimented for the organisation of the fine international collaboration essential for the final results.

The projects on plant-microbe interaction are dealing with important environmental problems. They are furthermore welcome as extending the approach from molecules to whole organisms and populations. At the same time the panel believes that the productivity of the human pathogens group suffers from its concentration on bacterial genes and proteins without work on the cellular and whole animal level. The Division appears to continue to attract good graduate students from several Graduate Schools, and to take good care of them.

Justification for rating

A majority of the publications submitted for evaluation are of good international standard. While the work on the structure and assembly of bacteriophages is of very high international standard, the research overall is more uneven.

Recommendations

The panel encourages the Division to expand its diversity of approaches and research methods and to take a broader view on pathogenesis research in collaboration with clinical research groups.

The Institute of Biotechnology

Rating: 7

Brief description

The Institute is a somewhat different organisation compared with other Departments we considered in that its sole purpose is research (and research training). It does not have any undergraduate teaching responsibilities nor the curatorial or other functions of the museum departments. It receives preferential funding and thus expectations of its research performance must be greater than of other organisations we considered.

The Institute is made up of in-house groups as well as groups that are also administratively associated with Divisions within the Department of Biosciences. These patterns of affiliation are complex. The current programmes are as follows: 1. Molecular Neurobiology. 2. Developmental Biology, 3. Plant Molecular Biology. 4. Structural Biology and Biophysics, which is in a phase of marked expansion and reorganisation. 5. Cellular Biotechnology, which has just been formed from parts of previous programmes of Molecular Genetics of Microbes and Glycobiology and Molecular Medicine. 6. Core Facilities, which are in a marked state of transition. Some of the relevant core functions will be incorporated into the newly constituted Structural Biology and Biophysics group. Other facilities such as those for transgenic mice and microarray analysis are scheduled to expand in a major way in the immediate future.

Assessment of Strengths and Weaknesses

The Institute clearly has developed a capacity to plan and to make priorities for future activities, for investment in costly facilities as well as for recruiting new group leaders and for disassociating veteran group leaders. This capacity continuously to reformulate policy is an outstanding characteristic of this institute, engendered by a guidance body of international membership. The planning functions and acceptance of the impermanence of the staff depend on a shared sense that all the staff have a common cause, and that all are dedicated to the pursuit of the highest quality science.

Indeed, it is clear that this sense of common cause and the excitement of participating in front-line research is experienced also by the graduate students at the Institute. The fine research atmosphere and future orientation of the members of the Institute is a tribute to the strong, knowledgeable and dedicated leadership provided by the current Director.

Another strength of the Institute is its openness, expressed both locally and internationally. Thus, the core facilities have provided in many cases nationally unique opportunities for research with costly front-line techniques to scientists outside the institute.

At the same time international collaborations as well as foreign staff have greatly enriched the research efforts of the Institute. An important function of the Institute has been to provide a supportive research environment for young scientists at a critical stage of their careers. Similarly, the staff of the Institute have pursued very strong graduate student training programmes both as research advisers and as teachers in advanced courses. In brief, the Institute has done well in the demanding task of competing in the open market for most of its research funds whilst adequately nurturing its human resources.

On the other hand, the intense activities of the Institute have created a space problem. Space constraints are particularly evident in the case of animal facilities for the construction and use of transgenic mice. Many students complained of constrained space in which to carry out their work. We also noted a marked discrepancy between the proportion of women graduate students in the Institute and the scarcity of women group leaders and this had been noted also by the graduate students. We appreciate the historic reasons for what is a very common discrepancy in research institutes and Universities, but it is clearly a situation that cannot anywhere be allowed to continue indefinitely.

Justification for Rating

The overwhelming majority of publications from this unit appeared in high class international journals and a significant number of these were published in the most prominent journals. In addition to the high quality of the publications, their numbers and diversity of subject were also impressive. Patents and spin-off applications from the basic research provide another dimension to the excellence of this Institute. At the same time, when the advantages that the Institute has been given are considered, any grading lower than 7 would have constituted a significant failure.

Recommendations

We recommend that the Institute focuses its research programme profile more clearly as the size of the individual programmes increases. There is a possible danger of imbalance in the near future. The continued development of new strategic core facilities, though very resource-demanding, is an essential function of this Institute. We encourage the Institute to continue an aggressive renewal policy for its core facilities. At the same time we stress the importance of maintaining an open, co-operative attitude that encourages the use of these facilities by students and investigators from outside the Institute. One way to encourage this co-operation is vigorously to participate in the development of the Biocenter concept at Viikki.

Likewise, we recommend that the staff of the Institute participate more actively, though not to a debilitating degree, in the undergraduate education programmes of the Viikki campus. We expect such participation to promote two positive effects: It will provide further encouragement of research co-operation with other biologists in the Viikki community. It will intellectually benefit both the staff of the institute, and possibly the students at Viikki.

Institute of Medical Technology, University of Tampere

Rating: Not applicable

Brief description

The activities of the Institute derive from the laboratories of seven professors. The laboratories are focused on the following research specialities: Cancer Genetics, Pathology, Molecular Immunology, Molecular Medicine, Coeliac Disease, Molecular Biology, and Bioinformatics. During the period 1995 to the present the number of staff grew from 12 to 127. The mission of the Institute is to carry out research and training in medically relevant natural sciences. Accordingly, it draws graduate students nationally from science departments and from medical faculties both local and national.

Assessment of strengths and weaknesses

The policies of temporary appointments with the possibility of rolling tenure, continuous quality control, and competitive grant support for research has been a very effective means of establishing a fresh atmosphere at the Institute. Indeed, the recruitment strategy has been quite successful. It has brought together a complementary group of excellent young scientists who are pursuing programmes in very timely and medically relevant sciences. Much of their work is in fact very good cell biology.

The Institute has developed a well-conceived graduate-training programme and there is a good working spirit among the graduate students of the Institute. The Institute is developing good contacts with the University Hospital in Tampere and it benefits from co-operation with other national laboratories. International recruitment and exchange has resulted in a staff with more than 50% foreign postdoctoral investigators.

The down side has two aspects. One is that the small size of the Institute limits its research capacity and diversity of interests. The other is that it suffers from a lack of support from pre-clinical departments in the medical faculty.

Justification for deferment of rating

The papers published in the past several years by the members of this institute would certainly merit a rating of 7. However, many of these were the products of other institutions and were submitted from laboratories separate from the Institute. Likewise, the Institute had barely come into existence by 1995, and a start-up period was required before it could function normally. For these reasons we defer a rating on the publications.

Recommendations

The future expansion of the Institute is necessary in order to enhance its expertise and to generate a sufficiently large research base for the acquisition of new core facilities. This in-house expansion is likely to encounter some obstacles. One of these is that the isolation and small size of the Institute may present an obstacle to recruiting. In addition, competition from other institutions in Finland is likely to harden. Indeed, it would be surprising if such competition did not result in the loss of some current staff.

There are at least two ways that future expansion and renewal of the staff can be supported. One is to generate a more attractive and supportive local environment for the Institute by engaging the local medical faculty in joint programs such as the formation of core facilities, training programmes and research projects. Likewise, recruitment of pro-

missing, young foreign scientists would provide an attractive international dimension to the institute. Initiatives in both of these directions have been taken already. We strongly urge the Institute to pursue these initiatives aggressively.

Department of Ecology and Systematics

Overall Department rating: 5

Separate Division ratings are provided under each sub-section.

The overall rating has been calculated on the basis of the weighted average of grades relative to number of listed research active staff in the various Divisions. There is a considerable degree of variation in rating amongst Divisions, based on both the quality of research publications submitted and on the nature and scope of the research itself.

Brief description

The Department of Ecology and Systematics has around 80 research active staff and has resulted from the reorganisation of former more traditional departments. At present, the Department is split across at least two buildings and represents a rather disparate collection of areas. The Department has two larger Divisions (Population Biology and Systematics) and three small Divisions (Hydrobiology, Instruction in Swedish, Environmental Biology). Considerable use is made by most Divisions of the various University Field Stations.

Division of Population Biology

Division Rating : 7

Brief description

This is a large (30 research active staff) , very active, research grouping covering a diverse range of topic areas. The Division has a strong international reputation in spatial ecology, population dynamics and conservation and to a lesser extent in behavioural ecology. The Division has been recognised as a National Centre of Excellence and has a very impressive publication record and research income.

Assessment of strengths and weaknesses

The Division is an internationally renowned group with a number of leading international scientists and with a relatively young staff. There is a considerable number of very high profile publications produced by the Division and the general publication rate is very high. There are many other strong indications of productivity and quality (such as international linkages, research income, positions held by staff, output of PhDs). The breadth of areas covered by the Division is excellent, and there is a clear and well considered general set of research themes based around spatial ecology. The development of the molecular laboratory has been a positive addition to the research profile of the Division. The Division appears to be an exciting and stimulating working environment, a perception also voiced by the postgraduate body.

There appear to be no means or will to direct research policy in the Division (nor in the Department as a whole) as under the current level of central funding, there is no means of the Division supporting the research. As a result, there appears to be little interaction between research groups. There also appears to be a high turnover of staff

with too much teaching falling onto the non-permanent staff such that their research development and output may suffer. The research income and output of the Division is clearly dominated by a few groups, headed by high-flying, international research figures, and as such is currently fairly dependant on such researchers remaining in the Division. This potentially leaves the Division and Department very vulnerable to the career aspirations of a nucleus of individuals.

Justification for rating

The publication profile is very strong with a majority of publications at a high international level and virtually all others at a good level. The publication rate and full bibliography are also impressive and the Division is recognised as being among the top departments in Europe in its general research area.

Recommendations

We have concluded that the Division is currently extremely successful and benefits greatly from the stature and success of a number of key figures. However, we believe that it would be in the best interests for the future of the Division to ensure that more is done to encourage the development of the next generation of top researchers. Likewise, more interaction between this division and other elements of the Department and with the museums would be of general benefit.

Division of Systematics

Division rating: 3

Brief description

The Division of Systematics has a staff of 23 persons, of which 14 are research active. It was originally part of a larger botany department and was somewhat artificially split off from related scientists, but it is still in close contact with the botanical department at the museum, both in terms of physical location and some scientific collaboration. The research area is not fully coherent. It is centred around systematic botany but includes also biomonitoring and environmental issues (global warming, heavy metal pollution).

Assessment of strengths and weaknesses

In general, the systematists of this division seem to have a good international reputation in their respective fields, and some members are recognised as being amongst the leaders in their particular specialist field. However, the nature of publications and scientific inquiry appears to be rather limited in scope. There is a considerable international collaboration with regard to many projects within the division as a whole. Some of the researchers are well acquainted with the theories and methods of modern taxonomy and systematics.

The division has good examples of ethnobotanical (in particular, ethnomycological) applications of taxonomy, which also have important potential for future pharmaceutical research and uses. Long term collections of data (e.g., monitoring of heavy metals) are being made available to a larger network of (largely Nordic) research projects.

There do not seem, however, to be many contacts between the different groups of biological systematists at the University (Zoological Museum, Botanical Museum, Department of Ecology and Systematics) and an overall research strategy for the division is

lacking. Our perception is that the division contains too broad a mixture of many lines of rather traditional research, some of which are winding down, others having the potential to be maintained at the present level or to increase in importance.

Publication policy appears too local and in some cases too concentrated in narrow specialist journals, however, our comments in the overall introduction to our report in this regard should be noted.

Justification for Rating

The panel judges that the majority of the submitted works are at least at a fair international level. This rating is based on the lists of selected papers submitted. It should be regarded primarily as a reflection of the impact and importance of the journals in the field of systematic biology. The ultimate scientific quality and relevance of the individual papers may be higher than indicated by the score.

Recommendations

Systematic biology is increasingly recognized as an important and academically advanced field of science. The phylogenetic relationships of organisms (i.e. the evolutionary history of all life forms) is the basis for all other biology, and in recent years systematics has undergone a fundamental advance with regard to its theoretical framework, and now has completely new sets of tools, including those associated with DNA analysis. In addition, the traditional descriptive part of systematics (often referred to as alpha-taxonomy) is in fact more needed than ever, considering the important issues of biodiversity and its conservation. There is also an important use of long-term and large geographical scale faunistic data in the development of new ecological, evolutionary and biogeographical ideas.

The staff of the Division of Systematics has the potential to participate in the development of systematic biology in Finland. It should look forward and outwardly, and it should join forces with colleagues at the Botanical and Zoological Museums to further this goal. Much more interaction is needed and should include teaching both undergraduate and postgraduate students the basics of both theoretical and practical taxonomy and systematics.

We feel that the division needs to look at its future direction in research, that it should develop its taxonomic projects more on the core principles of systematics and phylogeny, but also to develop its promising applied profile. We recommend that the researchers of the division focus more on publishing in high standard international journals, although we are aware of the justification for sometimes placing large monographs and floral overviews in other kinds of publications.

We further recommend that the University once again considers the organization of the museums and the Department of Ecology and Systematics, so that the critical mass of systematic biologists is optimized and the recruitment of future generations of systematists is secured. This of course demands that the systematists of the University and Museum become jointly more involved in teaching and postgraduate training.

In addition, the Division is encouraged to introduce more conceptual approaches and testing of hypotheses, such as those being developed in population biology. This would be advantageous to the development of the whole Department's research profile as well as the education of the next generation of scientists in this field.

The Laboratory of Molecular Ecology and Systematics (MES) is a great asset to the University and should be developed. Its final location can be discussed and will depend on how the systematic components of the University will be organised in the future, but it seems natural to consider its move to the Viikki campus, where it may become a centre for interaction not only between systematists, but also with (other) molecular biologists and biotechnologists.

Division of Hydrobiology

Division Rating : 5

Brief description

This Division is one of the smaller in the Department (with 11 active researchers in 1998) with a relatively modest research income. The Division appeared to us to lack some leadership. The active groups are dependent entirely on soft money and on senior advisors in the subject area from outside the University. The range of subject areas covered is relatively restricted and the situation of this Division highlights the general lack of interaction and co-ordination of aquatic environmental research within the University as a whole.

Assessment of strengths and weaknesses

The young, temporary members of the Division seem very able, dynamic and are publishing in good to top journals in the field. The rating of the Division is largely attributable to the more recent output of these researchers.

Senior staff are not prominent in the Division's selected publication list and the full bibliography of the Division looks relatively weak, with too many reports in the 'grey' literature. The selected publication list seems to be dominated by publication in one particular journal. There is a low output of PhD students to date and the Division seems to be rather isolated from other related research groups and activities in the University apart from the research group working at Tvarminne Research Station where interactions with other groups are possible.

Justification for rating

A majority of the submitted publications are at a good international level, and most others are at a fair international level. This relatively high rating is largely attributable to the more recent publications of a few of the younger researchers.

Recommendations

There are clearly some promising young researchers within the Division, but as they are all temporary, there must be a particular question raised over the long term future of the Division. Establishment of a more permanent core of these active researchers and greater direction of the Division would be beneficial. Reorganisation of aquatic research within the University as a whole would also be beneficial to the discipline. There seems to some interest in the Department of Limnology and Environmental Protection for such reorganisation.

Division of Instruction in Swedish

Division rating : 4

Brief description

The Division is relatively small (11 research active staff in 1998) and appears to have been established purely in relation to teaching activities. Research activities are currently based around one or two small, isolated, groups. One of the more active groups has overlapping research interests with the Division of Population Biology, whilst the activities of the other main group seem rather anomalous within the overall research themes of the Department and overlap more with the Division of Animal Physiology in the Department of Biosciences.

Assessment of strengths and weaknesses

There are some promising younger researchers in the Division and a fair breadth of subject areas covered. However, the projects are small scale and there is little intellectual coherence in the group and staff are largely working in isolation. Some areas sit uncomfortably within the current Department. There are no logical arguments for the continuation of the Division on research grounds and individuals are already doing work related to that in a number of other Divisions and Departments.

Justification for rating

Whilst some of the publications are in good quality international journals, many are in fair journals and the full publication list is relatively weak.

Recommendations

We would recommend that staff in this Division are reassigned to other appropriate research Divisions or Departments, which would lead to better interaction on the research side and should not influence the teaching of courses in Swedish within the Department.

Division of Environmental Biology

This Division currently consists of a single research active staff member, and as such cannot be sensibly rated.

Recommendations

It is clear that the Division is too small to be viable and it should be amalgamated either with the Division of Population Biology or with one of the other environmental Departments in the University. We have discussed the overall organisation of environmental sciences in our report on the Biological Stations, which should be read in conjunction with this section.

Overall recommendations for the Department

Specific recommendations for each division have been detailed above, but a number of points should be made regarding the Department as a whole. It is clear from the details presented for the individual Divisions, that the research activity, output and quality is extremely variable within the Department. There is also little coherence in the overall

activities and in the current organisation of the of the Department, which we gather is largely a result of historical structures.

Some of the reorganisation has clearly been of benefit, such as in the Division of Population Biology, and appears to facilitate research work, and provide a stimulating environment and base from which to apply for grants. However, the Department as a whole appears as a collection of disparate groups with little inter-divisional interaction. Parts of the Department would be better placed in association with other groupings in the Science Faculty and with the Department of Limnology and Environmental Protection. This applies in particular to systematics and to the aquatic sciences. An overhaul of the entire environmental area in the University of Helsinki, however would be of considerable benefit. We have discussed this in our report on the Biological Stations, which should be read in conjunction with this one.

Zoological Museum, Finnish Museum of Natural History

Rating:4

Brief Description

The Zoological Museum has a permanent staff of 29 persons, of whom 14 are in academic positions. It is divided into three departments, Entomology, Invertebrates and Vertebrates. The museum has no official teaching duties, although individual staff members do participate in university teaching to some extent. However, in addition to scientific research and monitoring of the Finnish fauna, the museum has the responsibility to curate its large collections and to serve the general public in fields related to the museum.

The research is centred around the taxonomy and systematics of various animal groups. In addition, the museum contains the Finnish Bird Ringing Centre (as a part of the Vertebrate Department), which is also involved in the monitoring of certain mammal species.

Assessment of strengths and weaknesses

The museum staff have a genuine commitment to and interest in their work, and some of the researchers are well acquainted with the theories and methods of modern taxonomy and systematics and are interested in developing systematic biology at the University of Helsinki. The museum makes good use of long term data series in some areas, which should be appreciated by both the scientific and general community. The Ringing Centre has a very significant role in the bird ringing activities in Europe.

The museum also deserves recognition for its many contributions in the fields of descriptive taxonomy, faunal overviews, and mapping of fauna. All these being important background information for many other aspects of biology.

There do not seem, however, to be enough contacts between the different groups of biological systematists at the University (Zoological Museum, Botanical Museum, Department of Ecology and Systematics). An overall research strategy for the Zoological Museum is lacking. To a great extent, there appears to be a lack of confidence in putting trust in new developments in systematics, and in using the data collected for ecological, environmental and evolutionary enquiry. The lack of graduate students must also inhibit development, not least because of the fresh approach that youth brings with it.

Comments on specific departments

The panel is unable to make a thorough comparison of the research activities of the three departments, but we particularly would encourage more of the analytical approaches exemplified in some of the listed publications.

Justification for Rating

The panel judged that at least one third of the submitted works were at a good international level and many others at a fair international level, these together comprising a clear majority. This rating of 4 is based on the lists of selected papers submitted by the three departments, and should be regarded as a mean value for the museum as a whole. The general rating was somewhat downgraded, when the full bibliography list (1994-98) and the research approaches were taken into account.

Recommendations

Systematic biology is increasingly recognised as an important and academically advanced field of science. The phylogenetic relationships of organisms (i.e. the evolutionary history of all life forms) are the basis for all other biology, and in recent years systematics has undergone a fundamental improvement with regard to its theoretical framework, and now has completely new sets of tools, including those associated with DNA analysis. In addition, the traditional descriptive part of systematics (often referred to as alpha-taxonomy) is more needed than ever, considering the important issues of biodiversity and its conservation. There is also an important use of long-term and large geographical scale faunistic data in the development of new ecological, evolutionary and biogeographical ideas.

The staff of the Zoological Museum has the potential to develop systematic biology in Finland. It should look forward and outwardly, and it should challenge its botanist colleagues at the Botanical Museum and the Department of Ecology and Systematics to collaborate towards this goal. Much more interaction is needed and should include teaching both undergraduate and postgraduate students the basics of theoretical and practical taxonomy and systematics.

We also recommend that the researchers of the museum focus more on publishing in high standard international journals, although we are aware of the justification for sometimes placing large monographs and faunal overviews in other kinds of publications. We further recommend that the University once again considers the organisation involving the museums and the Department of Ecology and Systematics, so that the critical mass of systematic biologists is optimized and the recruitment of future generations of systematists is secured. This of course demands that the systematists of the University become collectively more involved in teaching and postgraduate training than before.

The Laboratory of Molecular Ecology and Systematics (MES) is a great asset to the University and should be developed. Its final location can be discussed and will depend on how the systematic components of the University will be organised in the future, but it seems natural to consider its move to the Viikki campus, where it may become a centre for interaction not only between systematists, but also with (other) molecular biologists and biotechnologists.

Botanical Museum, Finnish Museum of Natural History

Rating:3

Brief Description

The Botanical Museum has a permanent staff of 21 persons, of whom ten are in academic positions. It is divided into three divisions, i.e. Cryptogams, Phanerogams and Mycology. Individual staff members assist in the tuition of botany at the University to some extent. In addition to scientific research and monitoring of the Finnish flora, the museum has the responsibility to curate its large collections and to serve the general public in fields related to the museum. The work with the collections includes a considerable loan service to botanists around the world. A part of the collections have the status as a Large Scale Facility, associated with the European Union programme 'Advanced Instruction in Bryology and Lichenology'.

The research is centred around the taxonomy and systematics of various floral groups. In addition, the museum co-ordinates environmental monitoring and formation of databases concerning the Finnish flora.

Assessment of strengths and weaknesses

The museum staff have a genuine commitment to and interest in their work, and some of the researchers are highly productive in descriptive taxonomy and floristics. They are also active in many international projects and data collecting. Their floristic mapping is a major contribution to a network activity within the European Union. All this provides an important background information for many other aspects of biology. The museum promotes the use of its large scientific collections. The initiative of a Large Scale Facility status for the collections of bryophytes and lichens is a good example of this.

The staff recognises that the museum is at a turning point with regard to its future research directions. However, although it is aware of the new tools available in systematic methodology it appears to be unclear as to how to proceed. There do not seem to be enough contacts between the different groups of biological systematists at the University (Zoological Museum, Botanical Museum, Department of Ecology and Systematics).

An overall research strategy for the Botanical Museum is lacking. To a great extent, there appears to be a lack of willingness to apply the new tools provided by modern developments in systematics, and to use the data collected for ecological, environmental and evolutionary enquiry. The lack of graduate students was also evident and is perhaps symptomatic of the 'traditionally-dominated' approach to research.

Justification for Rating

The panel believed that the majority of the submitted works were at least at a fair international level. This rating is based on the lists of selected papers submitted by the three divisions, and should be regarded as a mean value for the department as a whole. The score should be regarded primarily as a reflection of the impact and importance of the journals selected in the field of systematic biology. The scientific quality and relevance of individual papers may be higher than indicated by the score. Our general comments on this issue in the introduction to this report should be read in conjunction with this section of the report.

Recommendations

Systematic biology is increasingly recognised as an important and academically advanced field of science. The phylogenetic relationships of organisms (i.e. the evolutionary history of all life forms) are the basis for all other biology, and in recent years systematics has undergone a fundamental improvement with regard to its theoretical framework, and now has a completely new sets of tools, including those associated with DNA analysis. In addition, the traditional descriptive part of systematics (often referred to as alpha-taxonomy) is more needed than ever, considering the important issues of biodiversity and its conservation. There is also an important use of long term and large geographical scale floristic data in the development of new ecological, evolutionary and biogeographical ideas.

We encourage the systematists of the Botanical Museum to focus more on problem-oriented questions than before. Classifications and phylogenies, which both can be regarded as hypotheses, can be tested scientifically, in particular with the help of new molecular approaches. Moreover, great strides in our understanding of the functioning of ecological systems can be made from the systematic analysis of long term data sets.

The staff of the Botanical Museum has a great responsibility to participate in the development of systematic biology in Finland. It should look forward and outwardly, and it should join forces with the colleagues at the Zoological Museum and the Department of Ecology and Systematics towards this goal. Much more interaction is needed and should include collective teaching both undergraduate and postgraduate students the basics of theoretical and practical taxonomy and systematics.

We recommend that the researchers of the museum focus more on publishing in high standard international journals, although we are aware of the justification for sometimes placing large monographs and floral overviews in other kinds of publications. We further again recommend that the University considers the organisation involving the museums and the Department of Ecology and Systematics, so that the critical mass of systematic biologists is optimised and the recruitment of future generations of systematists is secured. This of course demands that the systematists of the University become more involved in teaching and postgraduate training than before.

Department of Ecological and Environmental Sciences

Rating:5

Brief description

The Department of Ecological and Environmental Sciences (Faculty of Science) is situated in the city of Lahti, some 100km to the north of Helsinki. It is the only science department in an outpost of the University which specialises in adult education and distance learning. Its origin centres around previous and continuing major research programmes in and around the adjacent Lake Vesijärvi and the strong encouragement of the city itself. But it is now much more than that. It is effectively a substantial department of biological environmental science in the Science Faculty with a broad scope covering both terrestrial and aquatic areas. It runs self-contained undergraduate teaching programmes for around forty-five students as well as maintaining an up-to-date research programme. It is located in a large building which includes the environmental laboratories of the City of Lahti and the premises of a number of high technology small companies concerned with environmental monitoring and protection. Our impression was of a very pleasant and stimulating work environment.

The Department was founded in 1996 and has had up to five research active staff

per year. There are two professors, one of them very recently appointed. Current and recent externally funded major projects include studies on the rehabilitation of the drainage area of Lake Vesijärvi (European Union, City of Lahti), on xenobiotics and lake restoration (Academy of Finland), on biodiversity in humic soils and lakes (Academy of Finland, Finnish Biodiversity Research Programme), on lake function in relation to changing climate (European Union) and on carbon flux and climate change (European Union). A second area of focus is on toxic metal transport through soils, sediments and water with particular attention to arsenic and lead (Finnish Graduate School in Environmental Science and Technology, European Union).

There is also a valuable area of interest in plant population dynamics and vegetation science, involving only one scientist, whose work is internationally very well thought of and notable in that such plant ecology is barely covered elsewhere in the University. The new professor in soil ecology has significant current research programmes (based on her former university post including studies of soil-fungus-plant interactions in forest plantations in south-east Asia (European Union), on the effects of heavy metals on pine growth (Nessling Foundation), and on the impact of reindeer grazing on carbon and nitrogen dynamics in boreo-arctic systems. Approaches used *inter alia* in these projects include whole-system monitoring and modelling and experiments in mesocosms of a scale appropriate to the study of ecosystem properties.

Assessment of strengths and weaknesses

The Department has a relatively high number of good quality projects, with much collaboration with scientists on the main Helsinki campus and at the Lammi Biological Station, nearby. It has been very successful in obtaining competitive international funds and there is a strong link between the basic science and its applications to current environmental problems. This is accomplished despite the high teaching loads inherent in maintenance of a self-contained unit distant from the main campus. Graduate students have excellent facilities, in terms of habitats with which to work, laboratory and field equipment and office space. Collectively they form a supportive and collaborative group. The Department has the characteristics of vigorous, pioneering colonisation of a new environment, epitomised by its young staff. We were impressed that the entire graduate student and postdoctoral body of the Department was invited to meet us.

Just as the strengths of the department lie in its freshness and novelty, so also do some limitations. The need to establish a research programme in a competitive funding environment may have led to the occasional acceptance of projects for which supervision expertise limited. The small number of staff has also led to concentration of most supervision of graduate students on the founding professor, whose time is thus stretched more than is desirable in the interests of individual students. Isolation is perceived as a problem by graduate students because of their difficulties in accumulating sufficient course credits without travelling to Helsinki, and in access to literature prior to the rather recent period covered by libraries in Lahti.

Justification for the rating

We have confidence in the rating we have given. The majority of journals chosen for publication are good international ones and some of the work might have been acceptable in journals of even higher status. The Department is yet too small to be able to compete

with larger ones elsewhere that have greater scope and hence inevitably falls short of ratings of 6 or 7 but it has the potential to reach these levels.

Recommendations

This is a flourishing department and most of our concerns will be mitigated with time. The arrival of the second professor will spread the administrative responsibility and supervision load and this process will be eased if the present regime, perceived as perhaps a little over-hierarchical, in the department is relaxed a little. We appreciate the pressures that a new department feels in establishing itself but would suggest that the department is proving its effectiveness and that the senior staff can now afford to encourage the graduate students to express concerns that they may have and to act upon them where possible, following discussion.

We would like to see expansion of the department so as to widen its expertise and lighten the teaching and administrative loads in favour of creating more time for research, especially for the younger staff members and we foresee a central place for the Department in the University. We have commented on this in our report on the Biological Stations, which should be read in conjunction with this one.

Biological Stations of the Faculty of Science

Rating: The stations have no permanent research staff and the panel was asked not to give a rating, but to assess the significance of these facilities in the research environment of the University.

Brief description

The Faculty of Science maintains three biological stations. They reflect the three major general habitats of Finland: the Arctic mountains and tundra(Kilpisjarvi), the coniferous forest and its associated freshwaters(Lammi) and the Baltic coastal waters and archipelago(Tvarminne). All three are substantial institutions, employing up to 50 staff on at least a part-time basis to maintain them. They have both teaching & research roles, for many undergraduate and other courses make use of them, whilst the Departments of Ecology and Systematics(in particular), Geography, Geophysics, Ecological and Environmental Sciences, Biosciences, Meteorology, and Limnology and Environmental Protection all use them as bases for research. Additionally they are used by scientists from six government research institutes and visiting scientists from other Finnish universities and other countries. A small number of scientists self-employed on grants maintain semi-permanent research programmes and large numbers of postgraduate students are in residence during summer.

The costs of maintaining the three stations are large and not fully met by external income. It is thus inevitable that the University, in straitened times, will closely examine the benefits that accrue from the expenditure incurred. It may help to point out that areas of high-quality habitat for fieldwork, with facilities for processing samples, and for carrying out field experiments in secure conditions are as much parts of the infra-structure necessary for ecologists and other environmental scientists as fully serviced laboratories with central facilities such as electron microscopes, workshops, nucleic acid sequencers and synthesisers are for solely laboratory-based science, or farms for agricultural rese-

arch or specialist archives and libraries for humanities research. The University has accepted this obligation in the past, and, in view of the recent and imminent refurbishments being made to two of the stations, this clearly is its future intention.

But there are advantages in the maintenance of the Stations beyond this basic service. Large amounts of good and high quality research are produced at them; one of the main users is the Population Biology Division of the Dept. of Ecology and Systematics, to which we have given a rating of 7; about 80 publications arose from data collected at Kilpisjarvi, 170 from Tvarminne and about the same number from Lammi in 1994-1998. The Directors, who are employed as administrators, nonetheless contribute original research and at Kilpisjarvi this includes maintenance of long-term data sets of considerable value for assessment of the effects of environmental change. The facilities available attract valuable research contracts and overseas scientists, enhancing the intellectual environment for all.

Field courses, held at all Stations, are among the most inspiring and effective ways of teaching biology. Many prominent ecologists can trace the beginnings of their careers to such experiences and the flow of good students into graduate education is facilitated by them. Directors, and other independent scientists at the stations with docent status, provide much supervision for graduate students. Moreover, the Stations act as foci for promoting the public image of the University and its mission in the maintenance of environmental quality. Open-days are popular and offer a window into the university research that is tangible and undoubtedly indirectly supports the University's efforts to maintain its income from the electorate through the government.

We have considered a scenario in which the stations were discontinued. Much of the research could still be carried out elsewhere but at much greater cost: in the construction of replicate facilities; in time spent in organisation of logistics and travel; in ensuring experiments were secure; in collecting background data which is necessary and available for the areas around the stations because of their permanency; and in prospecting suitable alternative sites.

Similarly the organisation of field courses in other locations is certainly possible, but at much greater cost, for both accommodation and laboratory hire, and especially in time costs for those organising them. Such additional costs, of course, detract from the research effort of the scientists concerned. And, of course, the cross-fertilisation of ideas that occurs when large numbers of talented people are brought together for extended periods would be lost.

On the other hand, it is also possible that the effectiveness of the stations could be increased. Charging of overheads to pay for the facilities available is an innovation but is unlikely to meet the real costs and without proper financial underpinning, the improvement as opposed to maintenance of facilities will be jeopardised. Perhaps even more important, however, might be adoption of systems to increase the status of the stations and enhance the international quality of the research.

Presently there is no selectivity of researchers or projects, so that expensive facilities are made freely available to all who wish to use them. There are Boards of Management but not of science policy. In a sense this does not matter unless there is competition for space and facilities and it has a very human tolerance about it. But it does not allow the establishment of a culture that funding bodies perceive as as rigorous as that perhaps in the purely laboratory sciences. The consequence is that an increasing proportion of research funds flows into the latter, especially where profitable industrial outcomes are

anticipated, at the expense of the environmental sciences, which are concerned with the diagnosis and solution of problems that may be fundamentally more important for Society as a whole. It is desirable to create a balance of power between those biological sciences which may engender future ethical and environmental problems and those that are concerned with the avoidance, mitigation and solution of such problems.

Biological environmental sciences in the University of Helsinki are not so well co-ordinated as biotechnological sciences and cellular-level biology. In consequence they may lose image, influence and effectiveness. The same is true for systematics and taxonomy, essential sister subjects for ecology, which are also in disarray. Several features lead us to this conclusion. First, despite the exceptional standing of research in animal population biology, it is little supported by the whole-organism biology of animals, including environmental physiology, nor by remotely equivalent strength in plant population biology and ecology. Secondly, areas of biological environmental sciences where there is strength, are spread in isolated units among several departments. Limnology lies in three departments- those of Limnology and Environmental Protection, Ecological and Environmental Sciences and Ecology and Systematics. Expertise on heavy metal transfer similarly lie spread among these three departments.

Thirdly, there is little evidence of linkage between environmental policy studies and the environmental and human biology which underlies them, nor of linkages with sciences such as pedology, oceanography, geology, meteorology and hydrology which underlie ecosystems, though it has not been within our remit to survey these. Fourthly, there is a confusing system of departmental nomenclature with two departments called 'ecology' or 'ecological'. Finally, there is clearly little contact, even within the same Faculty, between studies in agricultural management and its consequences for lakes and rivers.

There appear to be many historical factors which have kept the environmental sciences separate in the University of Helsinki but the twenty-first century is no time for maintenance of the fossilised subject divisions of the nineteenth. *We believe that the University needs to regroup these areas into a new configuration, with a strong Institute, using its expertise, perhaps, from the creation of the Institute of Biotechnology. Its existing facilities at the field stations and the proximity of the Lammi station to the opportunities provided by the nucleus in the Department of Ecological and Environmental Sciences at Lahti and the freedom from convention provided by development of a new site might collectively be harnessed in the pursuit of this goal. The University undoubtedly has strengths in the environmental area that rival those in the cell biological areas but they perhaps need a fresh stimulus and strong co-ordinated leadership. The same is also true of systematics, which might form the third component of a tripartite regrouping. In this way, the fundamental essence of a University in promoting the interests of society in an equal questioning and investigation of all aspects of its activities is maintained.*

ANNEX G REPORT OF THE PANEL 21. ART RESEARCH

1. GENERAL COMMENTS

1.1. Thanks and congratulations

We are honoured to have been invited to contribute to Helsinki University's research assessment exercise, and should like to thank the University for the friendly welcome and generous hospitality we have received during our site visits.

We congratulate the University on having devoted so much care and attention to the well-being of the units we have been inspecting. In many respects their resources are very good indeed, and they are especially fortunate to carry out their daily work in a physical environment at once so beautiful and lovingly preserved. Also from the point of view of organization, we have the impression that the University has been taking its responsibilities seriously, and we are specially struck by the new institutional framework for art research, which seems very much to the liking of most of the scholars involved. In our view, it has great potential for future development.

Above all, however, we have been very favourably impressed by the units themselves. Much of their published research is of a very high standard, and their members of staff show a true love of their subjects, a strong sense of dedication, and commendable energy.

1.2. The balance of responsibility

At the same time, it is quite obvious that some units, when judged by the criteria the University has asked us to apply, have not been performing too well. Our reports on the individual departments will apply the criteria as strictly and clearly as possible, and this may well give some units food for thought.

In our opinion, however, the units which have problems may not bear the sole responsibility for the present state of affairs. We are wondering whether questions might also have to be asked about the larger academic milieu within which they are operating. It seems to us that certain issues may call for consideration at the University's higher levels of decision-making, and that the University should perhaps ask itself whether, despite its praiseworthy and very concrete commitment to humanities subjects, it is in every respect living up to its own high ideals.

By way of introduction to some more particular comments on this (1.3-8 below), we should like to offer the following general observation.

If subject areas such as Finnish- and Swedish-language literature in Finland, Finnish art and architecture, theatre in Finland, and Finnish musicology were allowed to decline in Helsinki, it would be unrealistic to hope that other universities will be able to fill the gap. On the contrary, the University of Helsinki can surely be said to have a quite unique cultural and social responsibility here.

1.3. The culture-bearing role of humanities subjects

Much of the most important work done by the units we have examined does not show up in the kind of evaluation we have been asked to carry out. Quite simply, it does not take the

form of front-line research publications. We are not suggesting that these units should be allowed to produce *fewer* front-line research publications. On the contrary, the University would in our view be perfectly justified in hoping for *more* pioneer research in certain areas. Yet the fact remains: Helsinki University has had a long tradition of scholars in humanities subjects who have also played a significant role in the more general cultural life of the country. In a way which foreign visitors often comment upon, these distinguished men and women have contributed to a high level of public debate, and to a widespread interest in languages and the arts. Finland can justly claim to be a civilized country, and a due share of the credit for this must go to Helsinki University.

In the units we have visited, there are still gifted scholars who are shouldering this vital task. Yet the subtext of the message they are sometimes getting nowadays, and not least from this evaluation exercise itself, is that such activity is not really very important at all.

If, as we fear, there is indeed a problem here, the blame can hardly be shifted onto the Ministry of Education. If the Ministry of Education's own way of distributing funding is unenlightened, the University should in our view say so, loudly and clearly. The University's internal distribution of funding is in any case its own responsibility.

We repeat: there can be no question of the culture-bearing role being seen as an *alternative* to front-line research. On the contrary, of the units we have seen, the one which at present is performing best according to the evaluation criteria is also the one which has been doing most in the way of essential cultural work in society at large, particularly in the form of truly excellent Finnish-language publications for a broad audience. Yet even this quite outstanding unit has now been forced to cut down on such activity for purely economic reasons.

1.4. Support for internationalization

The University has asked us to make allowances for the fact that the most obvious audience for publications on the so-called national subjects is in Finland, and that the language of publication for much of their front-line research is therefore likely to be Finnish or Swedish. This seems to us a very sensible consideration.

At the same time, however, we are pleased to report that the scholars we have been talking to would be keen to get a wider international exposure for their work, and that this applies not only to scholars in subjects such as art history and comparative literature, where a serious scholar should certainly have an ambition to publish in an international language, but in the national subjects as well. We think this reflects credit on the scholars themselves and the University. It means that Helsinki scholars really want to do their bit to ensure that people in other countries get a reliable impression of cultural life in Finland.

What we are wondering, however, is whether scholars are receiving appropriate kinds of moral and economic support here. More particularly, some scholars will inevitably need help in getting their ideas and findings into a truly attractive and persuasive form in one of the major international languages, and some of them would probably welcome a chance to improve their skills in academic writing in, say, English. Also, the University could well consider the possibility of establishing a humanities translation fund, whose importance could be compared to financing a new and effective scientific instrument for the Alaboratory sciences@. Furthermore, the University could perhaps

itself make a major new initiative in international publication activity, either in the form of a fully developed Helsinki University Press, or through cooperation with established publishers in Finland and elsewhere, with various funding bodies, and perhaps with other Finnish and Nordic universities as well.

As a gloss on this last suggestion, we can mention that books published in Finnish scholarly series are sometimes classified by British and American libraries as periodicals. This means that some very learned and beautifully produced volumes of Helsinki research are less than readily accessible, simply because of the way they get catalogued.

Similarly, the fact that most Finnish doctoral disputations still take place on the basis of a published book means that in other countries they may be poorly received or even totally ignored. Many foreign reviewers expect a doctoral thesis to be published, if at all, *after* the degree has been awarded. This means that the text can be revised, and also made a bit more readable.

Here we are not suggesting that Finnish scholars in the humanities should be even older before getting their first major work into print. On the contrary, we think that the requirements a doctoral thesis is expected to fulfil in the humanities are sometimes unrealistically high, both as regards scope and finish, so slowing young people down and making them uncompetitive in the international academic job market of the future. (Please see further comments on doctoral theses below.)

But clearly, with the number of doctoral disputations steadily increasing, the University may well have a responsibility to see that only the best theses get published in book form, and that these become available through channels, and in a form, which will attract the widest possible readership.

Interestingly, the most successful of the departments we have examined has already established a fairly regular connection with a major university press in United States, with whom they jointly publish some of their most important works. This already suggests one kind of model for the humanities, which the University could perhaps seek to encourage by positive assistance.

1.5. Scholarship and gender

Like other universities in Finland, Helsinki University has an extremely serious gender problem in the humanities. This is part of, and contributes to, a problem in Finnish society as a whole. We are strongly of the opinion that the University has a crucial role to play in trying to counteract the very damaging polarization of Finnish social, cultural and intellectual life into masculine/feminine, hard/soft, science/humanities.

In the units we have visited, there are very few male students and researchers indeed. This is disastrous for women, because it means that the subject areas concerned, and the professional openings they lead to, are regarded as women's branches, and therefore offer low pay and poor job security. For men, it is perhaps even more disastrous. It means there is a huge social and peer pressure on boys to study anything *but* the humanities, so that many of them probably end up pursuing studies and careers to which they are less than perfectly suited. For Finnish men, the threshold to humanistic studies is so high that those of them who do cross it are sometimes extremely highly motivated and perform exceptionally well. For Finnish society as a whole, one of the most obvious consequences of the unfavourable gender ratio is that the majority of schoolteachers are women.

We should not recommend a policy of positive discrimination for men in the humanities subjects. This would be unjust to women, and would in any case probably backfire. But we do think that, through a variety of well-planned and co-ordinated measures, the country's leading university, ought to be able to get across the message that the humanities are for everybody. This is clearly an issue for the entire University to think about, since if the number of male humanists were to go up, the gender balance in other faculties would probably be affected as well.

If the units we have studied could be encouraged and fully backed up in an effort to break out of this tragic vicious circle, we are sure that their entire working atmosphere and sense of social mission would be radically improved. So much so, that their research quality and productivity could also be expected to rise.

1.6. The procedure for professorial appointments

In at least one of the units we have examined, the disappointing statistics for doctoral disputations are partly linked to discontinuities of staffing at the professorial level. A long interregnum between the retirement of one professor and the appointment of a successor can have very serious consequences. We would suggest that, as a perfectly normal procedure, the Deans of Faculties ought to indicate to professors that they are expected, for the good of their own department, to hand in their resignation at least two years before their actual retirement. This should be enough to ensure a smooth change-over

1.7. Job cuts

Some of the units we have examined are suffering very badly from job cuts, or are living in the fear that cuts may be coming in the future. Even if cuts are sometimes unavoidable, and even if efficiency is bound to be one of the relevant criteria, it is important that a unit should not be hit by a serious cut at the very moment when it is in the process of significantly improving its performance. Nothing could be more demoralizing and counterproductive.

1.8. Acceptance of proposals for doctoral theses by the Faculty Board

We have seen one or two signs that the Faculty Board regards the acceptance of proposals for doctoral theses as a routine matter not requiring much discussion. Ideally, the Faculty Board should be trying to check that doctoral students are tackling realistic and well-planned tasks, that they have the benefit of all the relevant on-site wisdom, and that all the different departments have roughly similar expectations in terms of the scope and quality of work involved. In saying this we are not criticizing the proposals supported by any particular professors. The point is merely that in academic, no less than in medical matters, a second and third and fourth opinion can sometimes be helpful. Professors interested in their students' welfare will only welcome an increased element of collegiality in these matters. After all, the theses produced are an advertisement for the entire Faculty.

2. REPORTS

2.1. Aesthetics

The Department of Aesthetics has had a very dynamic and productive record for the five year period. It produced five doctoral degrees, two of them in the past year. Some of the research is at a high international level. The chair of the Department seems to be a very good leader and he seems able to inspire confidence in the Department through his own expert publication record.

The Department is well connected to the study of philosophy at the University, although it historically has been a sub-area of the Department of Comparative Literature. Its major areas of interest are in philosophical aesthetics. It seems to feel itself as closely oriented to philosophy, and tends to treat aesthetics as a sub-discipline of philosophy. The work is solidly grounded in Anglo-American analytical philosophy, but its two leading researchers seem at the moment to be moving towards European phenomenology (especially Heidegger) and to environmental issues and perhaps other areas where aesthetics meets practical issues.

All but two of the fourteen publications are in English; many in well known journals of philosophy or with publishers of international standing. The department has a sturdy research connection with the Institute of Applied Aesthetics in Lahti that publishes some of their books and hosts conferences and summer schools for their use.

The Department has also had a series of nationally and internationally funded research projects of which some have already terminated in publications. There have been two dynamic research projects devoted to interpretation, and another project about the Unity and Distinction of Aesthetics and Ethics, which deserves attention for its international potentialities. They also have one whole issue per year of the journal *Synteesi* devoted to aesthetics.

It might be good for the Department to have more cooperation with the Philosophy Department. But it would also be useful to develop closer contacts to the contemporary art scene in Finland. The number of students is significant of the appeal of the Department's teaching. The teachers have a solid grounding in philosophy and theory in general, as well as in aesthetic theory. The Department could also more usefully supply the research training in art theory that some of the other Departments in the Art Research Institute are now providing for themselves. But the team still very much needs new members.

In sum, the Department of Aesthetics may be considered as belonging to the top 25 per cent of comparable departments in Europe. Its activity opens up the possibility of a wide field of exchange with other academic research centres in Europe.

Present rating: 6

2. 2. Art History

The department is led by a dynamic chair. It is full of activity, especially of the international kind. While the chairperson is a scholar of Finnish architectural history and theory, she encourages her staff to participate in many international gatherings, and she sets an effective example through her own professional activities. The department is deeply committed to new initiatives in critical theory and in art historical methodology, especially feminist approaches.

Because the department is small in size, it needs to be constantly engaged in a process of revision and rethinking, not least in the light of the main developments in the international field at large. Many of the students enter the cultural and political world, and would be in a position to make Finnish cultural issues relevant to the outside world.

The scholars of the department have several research projects going, such as that in Urban Studies and Women's Studies. The present head of the department, like her predecessor, represents the orientation in Urban Studies, especially as regards the history of Finnish wooden towns, and planning development over the past 100 years. There is careful scholarly work on Finnish mediaeval churches, and also on other forms of architecture, both ancient Greek and African. There is also a group of young scholars who concentrate their research on contemporary Finnish art and art theory.

An important instrument in research training is the national graduate school for art history. The department is independently active in forming study groups, which can focus on contemporary art and art theory, Italian art, or Asian and African art. The department has a prestigious series of summer schools which attract well-known scholars to Finland. It has built up an international network of foreign research students and scholars.

The publications are mostly in Finnish. But even publications on Finnish themes, not to speak of those on international topics, are often so interesting that they would be worth translating into international languages. The university should have the means to support this.

Among the strengths of the department can be mentioned its commitment to new initiatives in critical theory and art historical methodology. Since there are so many kinds of theoretical interest, the department could well seek to forge more links with the Aesthetics Department (who should also be interested in this). Such a development would result in a larger number of scholars well trained in philosophy and able to teach courses on the philosophy and theory of art.

Present rating: 5

2.3. Comparative Literature

The Comparative Literature Department has two professorships, two assistantships and an amanuensis. They seem to get enough good students to achieve their target of 14 masters' degrees per year, and they have also been performing very well in doctoral training, with four disputations between 1994 and 1998, and a further three expected before 2001.

In this connection the department has been very successful in acquiring project funding, and in cooperating with other universities. Three doctoral theses have emerged from the ground-breaking graduate school for literary theory and textuality (1995-8), a joint venture with the University of Tampere; two doctoral students are funded by a big project on Greek myth and European thought, which is arranged by the Academy of Finland and the Finnish Archaeological Institute at Athens (1996-8); and another doctoral student is in the national literature graduate school.

The areas of research covered are very diverse. One main interest is in the novel, both modern European and American, 'popular' and 'serious', and with South American novels as a likely future field. A second speciality is poetry, and especially Finnish poetry in a European context. And the third main area is Greek and Roman literature of antiquity, together with the classical tradition in Europe, including Finland. In addition, there

are some more miscellaneous interests, such as children's literature, classical Japanese literature, and the essay genre. The department's considerable quantity and range of work in all these areas also represents several of the most important paradigms and types of topic in present-day Comparative Literature research.

It does seem natural that a Comparative Literature department should have a fair breadth, and in this particular department the breadth is not achieved at the expense of a depth and quality of finish. The standard of the published works we have examined is generally very high, and the department has clearly been very successful in finding the right kind of external supervisors for its doctoral students.

A no less important observation is that the department's wide-ranging interests do not mean that it lacks a distinctive profile. The Helsinki department is the only one in Finland which has such a strong interest in the myths, literature and culture of antiquity, and in their continuing relevance for later writers, and especially Finnish ones.

One of the department's doctors has already had a revised version of her thesis accepted for publication by the University of Toronto press, and the department has had two doctoral students from Estonia. These directions must now be pursued still more energetically. Given the breadth and quality of the research now being carried out, the next phase of development must include a much more ambitious and systematic publishing policy, with articles regularly submitted to the major refereed journals, and with books coming out with internationally significant publishers. One would also expect a steady stream of foreigners coming to study with the department's distinguished teachers and researchers. By the same token, the department ought to move away from desk-top publishing, and also from the publication in Finnish of original research on international writers, even if there will continue to be a need for Finnish-language publications of a more popularizing variety.

The department is already at the stage of development when it could be encouraging its young doctors to contemplate careers at universities anywhere in the world. Not only are its doctors quite good enough for this. They also have a special profile, which would be extremely attractive to Comparative Literature departments in, say, the United States. In addition to their feel for the classical tradition, they are also conversant with the cultures associated with two minority languages (Finnish and Swedish), and are much more fluent in German and French than most American scholars.

The department could well develop a much stronger self-confidence, and have much more ambitious goals as regards international visibility. As part of this attitudinal change, department members could also be expected to develop their own powers of persuasion in oral English. At the moment, their way of describing their own work would not win them serious attention at the major international conferences where they ought to be shining.

Here they would greatly benefit from much stronger peer rivalry and peer support. The department has outstanding opportunities for joint research seminars with other departments which share some of its interests — with the language departments and with Nordic Literature especially. Although the new Arts Research Institute seems to be getting off to a good start under the leadership of one of this department's professors, the exciting new synergies *within* the Institute must not be allowed to overshadow the other, no less enviable possibilities within the Helsinki milieu.

Present rating: 5

2.4. Finnish Literature

The Department of Finnish Literature is a strong and productive unit which has the crucial responsibility for research in Finnish literature. It has an active research production and takes very seriously its task of spreading information about Finnish literature, both within the academic world and to a wider reading community.

Its ongoing research projects include a wide variety of subjects, such as poetry, genre studies, studies on women writers, fin-de-siecle conceptions of literature, and problems of contemporary fiction. Its special strength is in having built up a tradition of research based on a deep understanding of the cultural and historical context of literature in Finland. Recently, new theoretical models have been applied to Finnish material, such as performativity, poetical strategies, and reader reception.

The number of students taking their majors is limited to 13-15, but as a second subject Finnish Literature is open, and very popular with trainee teachers of Finnish. The new regulations about the status of literature in the school-leaving (matriculation) examination supports this choice. The load of teaching is heavy and prevents many of the teachers from attaining full research activity. Perhaps this is one reason why the number of doctor degrees is surprisingly low. Another reason is that they have had discontinuities in staffing at the professorial level. The new institutional structure will probably make the administrative work lighter and give the teachers more time for research. Approximately a quarter of the staff is doing research on extra funding, both from the Academy of Finland as well as from many private funds.

Most of the publications are in Finnish. Publishing in Finnish is felt to be a national duty, almost a privilege, as a way of bringing the insights of research closer to the general Finnish reader. Some of the publications give evidence of good coediting and cooperation with researchers from other departments nationwide. The pedagogical mission has been well taken care of, and there is a series of well-planned pedagogical books. But the department could well try to do more to bring information and examples of Finnish literature to an international audience and thus make it more accessible to foreigners. It is probably not possible or wise to translate all the research into a foreign language. Instead, one could develop the idea of a nationally based research journal of Finnish literature studies in English.

This pioneering work would need some financial assistance to defray the costs of translation, which would be very considerable: the translations would have to be of the very highest quality. As we suggested in our opening remarks, the University could well consider the possibility of establishing a humanities translation fund.

Finnish Literature could also increase its cooperation with other departments, such as Nordic Literature, Comparative Literature and Theatre research. There is already one book published as a sign of common methodical interest and cooperation with the Finnish language department. As far as international relations are concerned, the focus has been mainly on participation in Fenno-Ugrian or Scandinavian conferences. Recently some foreign postgraduate students have come to work in the department for a certain period.

Present rating: 4

2.5. Musicology

The Department of Musicology, which has existed as an independent Department since 1957, has won wide recognition during the period (1961-1983) when professor Erik Ta-wastjerna was at the helm. During that epoch it was virtually the only Department responsible for producing doctors in Finnish musicology; its programs naturally concentrated on Finnish music, and especially the work of Jean Sibelius. Since that time, the department has successfully maintained its leading position in this area, under the rubric General Musicology, thus giving full impetus to both analysis and history. But although it is perfectly appropriate that the interest in the historical development of Finnish musical culture has continued to be reflected, as in the recent publication of the first complete musical history of Finland in four volumes (1994-1996), there was perhaps a risk of a certain chauvinism, which might have meant that the Auniversal@ questions discussed in the international arena were unduly marginalized. At this point in time, however, the department's researchers also began to pay attention to musical semiotics, so avoiding the temptation of scholarly isolationism by exploring the universal potentialities of musical signification. Because it developed in the university environment, musicology existed in close touch with research into other art subjects, and with other disciplines such as philosophy, sociology, linguistics and anthropology (not to mention psychology, Artificial Intelligence research or mathematics): the semiotic turn allowed the Department of Musicology to forge links with all the cross-disciplinary developments. This led to the establishment of the quarterly journal *Synteesi*, produced in collaboration with the Finnish Society for Aesthetics, the Semiotic Society of Finland, and the Finnish Association for Studies in Art Education. At the same time, the department's students never lost access to a strong background of musicianship, including Apractical@ subjects such as piano, choral singing, instrumentation and even composition. Such an education has prepared them to compete for various positions in musical life, radio and TV, music administration, teaching, journalism, and so on: they do not necessarily end up as music researchers.

Independently of General Musicology, the Department of Music has developed two study programmes:

Ethnomusicology

Since the beginning of the century, Finnish musicological research leaned primarily towards the investigation of folk melodies and folksongs. This focus has now been enlarged to orally transmitted music, and to non-Western musics in general, and it includes the relationship between music and electronic media, plus the whole of *popular* music.

Music and computers

Computer-assisted music is the most recent field of development. The corresponding research involves active participation in the great conferences sponsored by International Computer Music Societies (Hong Kong 1996), as well as in specialized projects in the field of cognitive modelling (Seoul 1998).

The University's long traditions as a seat of learning have led the Department of Musicology to invite teachers and researchers from abroad on a regular basis. A very important part of the teaching is being done in English, German and even French, so that more and more students may straightaway get used to the level and atmosphere of international research. Among the larger events, the Department has arranged various sympo-

sia within the Musical Signification Project (held since 1985 at Imatra, and every two years in various places B Helsinki, Edinburgh, Paris, Bologna, Aix-en-Provence). And with the organization of doctoral and post-doctoral seminars, Helsinki has become the world centre for research in musical semiotics. The results and papers from the symposia and seminars have been regularly published by international publishing houses such as Mouton de Gruyter, Indiana University Press, CLUEB at Bologna etc. A series of reviews are published in collaboration with the Musicological Society of Finland (*Musiikki*), the Finnish Society for Ethnomusicology (*Musiikin suunta*); the *Studia Musicologica* of the University of Helsinki, the Gaudeamus Foundation and the Sibelius Academy have also published the research results and papers edited by members of the research-active staff. Another development is that the programme for voice processing, *Sound Processing Kit*, which the department pioneered in 1994, is now distributed all over the world through the Internet

With approximately 200 major-subject students and 30 new students every year, and with a teaching staff of 2 professors, one senior lecturer, one senior assistant and 3 assistants, the Department of Musicology must be regarded as pretty large by international standards. It has attained prestigious reputation within international academic communities. It must be ranked among the qualitatively best in Europe, and in the field of Musical Semiotics it is clearly the best in the world. The great challenge now facing the department is to maintain this degree of excellence. The head of department sets a good example to his colleagues, who must continue to develop in depth and scope.

Present rating: 7

2.6. Nordic Literature

For thirty years this department was run by a very distinguished scholar who strongly believed in the highest standards of academic excellence, and in encouraging students and researchers to be as independent as possible. During this period, only one student successfully completed a licentiate degree and a doctorate. Since 1995, she has been the department's only professor, though only on a *locum tenens* basis for the first few years.

It seems to us that she is working very hard to re-start the department's publication series, to encourage doctoral students, to find funding for them, and to create a fruitful research milieu. We were impressed by the pleasant atmosphere in the department, and both staff and research students clearly felt free to discuss the department's ambitions and problems in the frankest terms. All this bodes well for the future, and although the continuing lack of disputations is regrettable, there is a hope of two or three in the not too distant future. Some allowance should obviously be made for the situation from which the new professor had to begin.

Another problem is that, at precisely the moment when the new professor is just beginning to get research going, the department has been hit by cuts, and the threat of further cuts. In addition to the professor, the department's basic staff consists of only a lecturer in Finland-Swedish literature. For economic reasons, the lectureship is at present being kept vacant, and the professor has also had to take 30% leave during this autumn. Under these circumstances, it is commendable that the department is achieving anything at all.

The department has an extremely important culture-bearing role, especially for the Swedish-language minority, plus a significant educational role for the Finnish-language majority, both in the form of university teaching and through other channels. The professor herself is well known in the Nordic countries and beyond as a creative writer,

cultural commentator and journalist. Her most important recent publication is a book about adultery both in life and in a wide range of world literature, and although it is based on sound scholarship and sensitive reading, it is above all a book for the general reader. The department's doctoral students, similarly, tend to get involved in work for radio, television, the media and publishing, which seriously slows down their progress towards their doctoral degree, even if it also gives them work experience and contacts which may prove useful in their later career.

Even under these problematic circumstances, the department has managed to produce some good research. The former professor's work for a history of Swedish literature in Finland belongs to the period we are assessing and makes a real difference. Other members of the department have written some learned and very attractive articles, among other things relating Finland-Swedish literature to European philosophical traditions, to historical circumstances, and to questions connected with gender and personal relationships, all of which is illuminating and in key with current trends in literary-theoretical thinking. Another positive indicator is that the department has a tradition of cooperation with Åbo Akademi University, plus some new contacts with Stockholm and Uppsala.

But as far as research goes, morale is not at all what it might be. The department's members, despite their great gifts, and their obvious love of Finland-Swedish literature, seem to have a kind of inferiority complex about it, almost as if they would not expect anybody outside a very small minority of Swedish-language readers to get enthusiastic about it. We feel that this attitude is not only de-motivating, but actually quite misplaced. In the postmodern world, there is nothing the least bit boring about minority cultures anyway, and Finland-Swedish literary phenomena need to be much more fully researched, and more widely understood both at home and abroad. The department's staff and research students need to be much more purposeful and businesslike in setting and achieving research goals. For instance, the doctoral theses at present being planned are seriously overdimensioned, and we are very surprised that such proposals have been accepted by the Faculty board, which ought to be taking its responsibilities much more seriously. One proposal represents two quite separate and very demanding scholarly tasks which have been rolled into one, so imposing a quite unrealistic burden on the student concerned, while another is also very wide-ranging, and lacks a clear focus on particular texts or writers. More generally, the department needs to get away from the defeatist attitude that a doctorate is not really worth doing because it does not lead to a clear academic career path. There will be no new career paths unless there are well qualified people to stake them out, sometimes overseas. This is another reason why the department must work very hard to bring down the age of disputation, so that its young doctors will not have too many commitments to be able to pack their bags.

A very great deal depends on the professor, needless to say, who has made such an excellent beginning under very awkward conditions. It is only to be hoped that she will feel encouraged, and no doubt at least as important — be able to find the time, to bring the roles of culture-bearer and research-worker into a more viable parity, both in the example she sets her students through her own work, and in the department as a whole.

Looking ahead, the question of the department's administrative structure has considerable importance. Clearly it is much too small to stand on its own, and its members at present seem perfectly happy to remain together with Nordic languages. We tend to agree with them that a link with Comparative Literature would be less appropriate, though we do think that, perhaps at some later stage, a merger with Finnish Literature would have

real benefits, such as a more soundly based historical understanding of both Finnish and Swedish literature, plus significant economies as far as introductory courses in history, theory and methodology are concerned. For the present, the department may well feel it stands a better chance of building up its confidence and motivation by staying where it is, though much will also depend on whether higher-level decision-makers can see their way to guaranteeing the position of the lecturer.

Even so, we are bound to point out that important opportunities are at present being wasted. Extremely interesting synergy effects could arise from joint research seminars together with the departments of Finnish Literature and Comparative Literature. These could be obligatory for a certain length of time, and carry credits, for all licentiate or doctoral students. It is something of an anomaly that research students should be working on some of the same Finland-Swedish authors in all three departments and yet never giving each other peer support. This department's research workers would greatly benefit from such an enlarged forum for discussion, not least in terms of motivation.

The department is already on the mend. With continued efforts, with a more serious commitment to getting results, with well-planned and realistic research goals, with improved synergy between different departments, there is every hope that things will look totally different by the time of the next review.

If we were to give credit for culture-bearing activities, our overall rating for the department's present level of achievement would be a strong 4. As noted, however, we are applying the criteria we have been given.

Present rating: 3

2.7. Theatre Research

The department has a small staff of one professor, one assistant and two to four active researchers. Some of the research students take part in the teaching, giving approximately one course per term. The yearly intake is 10 students for majors, which should result in 8 Master's degrees.

This is the only university department in Finland with a program entirely dedicated to theatre studies. The main topics of research are Finnish theatre history, seen in terms of both historical periods and outstanding individual actors and directors, together with the analysis of performance and staging. The department has cooperation with the Theatre Academy, where the research emphasis is on artistic production. They have also contacts with the Christina Institute of Women's Studies.

The publications are mostly in Finnish. One reason is that the history of Finnish theatre needs still more self-understanding before being presented to an international audience. Not until recently has it been possible to make critical observations on the role of the theatre in promoting nationalism and idealised images of Finnishness.

The department has many projects at a planning stage, and with the new administrative structure there seems to be more time for research.

There are many signs of positive development. The department is building up its research activity after a professorial interregnum of several years. During the years 1994-1998 most of its present research staff were still preparing their MA theses.

The department has a solid summer school tradition of good international standing, with regular participation by leading world experts. Due to statistical rigidity these visits have not been included in the information about the international activities of the

faculty; the distinguished foreign professors are usually on Finnish soil for only ten days.

The department has developed Nordic relations, particularly by taking part in the activities of the Nordic Association for Theatre Studies. A recent volume of their periodical, with historiography as its main theme, has been edited by the head of the department. Another organisation which gives an opportunity to create international contacts is the International Federation for Theatre Research, of which the department's professor is the vice-president.

The weaknesses of the department reflect partly the uncertainty of economic support and the dependence on short-term grants. There have been ambitious plans to write a comprehensive history of the Finnish theatre, but the lack of financial support has slowed it down. But the department is also somewhat uncertain as to its mission. We did not think the department's members seemed very self-confident about their capacity to plan research, and the several different research areas demanding guidance place an unduly heavy workload on the department head.

But the department should not be too modest about its role as the centre of theatre research in Finland. It has a relatively high external research income, and it should give a lot of thought to how this can best be used. It certainly seems appropriate that a large part of it is spent on the international summer school, but the department's policy and research findings should be much better publicized. The department must now begin to make the most of its independence and possibilities.

Present rating: 3

3. THE HELSINKI POTENTIAL, AND HOW TO MAKE THE MOST OF IT

3.1. The quality of the students

In all the units we have examined, there is no shortage of excellent research students, who have a very solid and broad-based humanistic education behind them.

3.2. The special Finnish profile

Helsinki scholars in the areas we have been examining share a most distinctive profile, which means that they have a quite exceptional contribution to make to international research. This profile has two main aspects.

On the one hand, scholars have extensive and specialized knowledge of Finnish culture itself, a topic which is of far greater potential interest to the rest of the world than most of them seem prepared to recognize.

On the other hand, they all have what, by British, French, German or American standards, is a most extraordinarily cosmopolitan flexibility of mind. This is intimately bound up with their language skills. They have the experience of operating in two minority languages, are for the most part extremely fluent in English, German and French, and often have a working knowledge of some other languages as well. In many other parts of the world, by contrast, even Comparative Literature specialists sometimes base much of their research on texts in translation. Scholars elsewhere simply do not have the Helsinki scholars' effortless ability to navigate, mediate and form new intellectual fusions between the thought- and life-worlds of different cultural traditions.

3.3. Helsinki University as a research milieu

Helsinki University is a large university, with a wide range of subjects, many of them doing research of major importance, and many of them sharing particular kinds of interest. The physical environment is also exceptionally attractive, and the location at the heart of the beautiful capital city of a beautiful country, within easy reach of other major centres, is also an invaluable asset.

3.4. Realizing the potential

Certainly within the subject areas we have examined, there is no reason why Helsinki University should not realize its full potential and become one of the world's leading universities. In the field of Musicology it has in our view already achieved this, and some of the other units could well be at the same level in five years' time.

3.5. The University's share of the responsibility

In Section 1 above we have already explained our view of what further measures the University's higher-level decision-makers could take in order to give the departments the support they need and deserve.

3.6. On-site cooperation

At present, the departments we have visited are almost totally ignoring their single greatest resource: each other, and other departments as well. The new national graduate schools and other large projects may provide important fora for young researchers cooperating with scholars from other universities. But there is no real substitute for a well-functioning home base.

We strongly recommend that the Faculty institute compulsory, credit-carrying research seminars in which students from different departments would meet on a regular basis, and probably use English as the language of discussion. The great benefit of this would be twofold. It would be important for their intellectual development. And it would give the kind of peer pressure and peer support which they need if they are to develop the necessary skills of oral self-presentation.

We quite understand that some cooperation already takes place between different departments. But this is bound to be sporadic, and can never maximize the enormous on-site potential. The seminars would have to be imaginatively planned so as to suit the interests of particular students at any given time. Not all students would necessarily have to attend every seminar. And the seminars could be team-taught, or at least team-planned, by groups of professors, among whom the responsibility for chairing the sessions could rotate.

3.7. Self-confidence and ambition

As for the departments themselves, a fundamental change of attitude is needed. Almost without exception, the scholars we have met seriously underestimate their own importance. What they need to come to terms with is the point we make in Section 3.2 above. There is, in fact, a most striking paradox here. There can be very few other places in the world where scholars are so cosmopolitan in their knowledge, skills and mind-style. Yet it

is difficult to imagine scholars who are more nervous about leaving home, both metaphorically and literally.

Individual Helsinki scholars should

- * *leave desk-top publishing behind them;*
- * *get themselves published through the major international journals and publishing houses;*
- * *travel more, should further develop their skills of oral self-presentation in order to be effective at international gatherings;*
- * *attract foreign visitors and students to Helsinki;*
- * *and be ready and willing to spend at least some of their career in foreign countries.*

Professors, and the Faculty Board as a collegial body, should ensure

- * *that research is planned in such a way as to make the most of the special Finnish profile (as described in section 3.2 above);*
- * *that research workers do not waste time and energy on publications which are neither genuine popularizations of knowledge nor front-line research;*
- * *and that research workers, instead of spending years reading up on everything that has ever been written on every tiny detail even remotely connected with their interests, discipline themselves to a realistic but not over-indulgent timetable for completing their work, which in turn means that they must formulate clear and realistic research questions at an early stage, so that they will know what they are looking for when actually carrying out the research.*

ANNEX H, FACULTY RATINGS

	A	B	C
Faculty of Theology	5,8		
Biblical Studies	7	14	98
Church History	5	18	90
Comparative Religion	5	8	40
Orthodoxy and East Eur. Church Studies	5	4	20
Practical Theology	5	14	70
Systematic Theology	7	17	119
FACULTY	5,82667	75	437
Faculty of Law	4,8		
Criminal Law and Judicial Procedure	5	14	70
International Economic Law	4	14	56
General Jurisprudential Studies	5	15	75
Private Law	5	29	145
Public Law	5	16	80
FACULTY	4,84091	88	426
Faculty of Medicine	5,7		
Dentistry	6	34	204
Forensic Medicine	6	12	72
Public health	7	19	133
Institute of Biomedicine			
IBM/Anatomy	5	17	85
IBM/Medical Chemistry	5	37	185
IBM/Pharmacology and Toxicology	4	20	80
IBM/Physiology	6	28	168
Haartman Institute			
HI/Bacteriology and Immunology	5	20	100
HI/Medical Genetics	7	53	371
HI/Pathology	6	45	270
HI/Transplantation Laboratory	5	18	90
HI/Virology	6	19	114
Institute of Clinical Medicine			
ICM/Dermatology and Venereology	6	20	120
ICM/Diagnostic-Therapeutic	6	64	384
ICM/General Practice and Primary Health Care	3	5	15
ICM/Hospital for Children and Adolescents	6	85	510
ICM/Medicine	6	50	300
ICM/Neurosciences	6	17	102
ICM/Obstetrics and Gynecology	6	36	216
ICM/Oncology	5	7	35
ICM/Ophthalmology and Otorhinolaryngology	5	31	155
ICM/Psychiatry	5	19	95
ICM/Surgery	5	59	295
FACULTY	5,73287	715	4099
Faculty of Art	5,7		
Aesthetics	6	5	30
Archaeology	5	8	40
Art History	5	22	110
Asian and African Studies	6	16	96
Classical Philology	7	17	119
Comparative Literature	5	9	45
Comparative Religion	5	8	40
Cultural Anthropology	5	5	25
English	7	22	154
Ethnology	5	5	25
Finnish	7	27	189
Finnish Literature	4	10	40
Finno-Ugrian Studies	4	10	40
Folklore	6	9	54
General Linguistics	5	12	60
German	4	9	36
History	5	27	135
Musicology	7	14	98
Philosophy	7	27	189

A = Rating of the Department / Faculty
 B = Research active staff, mean for 1995-1998 in full figures
 C = A * B

Phonetics	4	10	40
Psychology	7	46	322
Renvall Institute	5	16	80
Romance Languages	3	17	51
Scandinavian Languages	6	16	96
Scandinavian Literature	3	4	12
Slavonic and Baltic Languages and Literature	6	19	114
Theatre Research	3	4	12
Translation Studies	2	5	10
FACULTY	5,66917	399	2262
Faculty of Science	5,7		
Astronomy	6	9	54
Biosciences	5	77	385
Chemistry	6	133	798
Computer Science	7	32	224
Ecological and Environmental Sciences	5	4	20
Ecology and Systematics	5	67	335
Geography	4	21	84
Geology	6	14	84
Geophysics	7	5	35
Mathematics	7	38	266
Meteorology	7	7	49
Pharmacy	4	32	128
Physics	6	64	384
Rolf Nevanlinna Institute	6	15	90
FACULTY	5,66795	518	2936
Faculty of Education	5		
Teacher Education	5	38	190
Education	5	25	125
FACULTY	5	63	315
Faculty of Social Sciences	5,1		
Economics	6	14	84
Communication	3	13	39
Institute of Cooperative Studies	1	7	7
Institute of Development Studies	4	6	24
Political Science	4	22	88
Social and Moral Philosophy	7	16	112
Social Policy	5	20	100
Social Psychology	6	9	54
Social Science History/Political History	6	9	54
Social Science History/Social and Economic History	5	12	60
Sociology/General Sociology and Demography	6	23	138
Sociology/Social Anthropology	7	5	35
Statistics	4	6	24
FACULTY	5,05556	162	819
Swedish School of Social Science (Social Sciences)	4	10	
Swedish School of Social Science (Politics and Comm.St.)	3	9	
Faculty of Agriculture and Forestry	4,9		
Agricultural Engineering and Household Technology	2	6	12
Animal Science	4	7	28
Applied Chemistry and Microbiology	6	53	318
Applied Zoology	5	8	40
Economics and Management	3	25	75
Food Technology	5	25	125
Forest Ecology	7	27	189
Forest Economics	4	9	36
Forest Resource Management	6	11	66
Limnology and Environmental Protection	4	18	72
Plant Biology	3	7	21
Plant Production	4	18	72
FACULTY	4,92523	214	1054
Faculty of Veterinary Medicine	4,5		
Basic Veterinary Sciences	4	13	52
Clinical Veterinary Sciences	4	17	68
Food and Environmental Hygiene	6	9	54
FACULTY	4,46154	39	174

Independent Institutes

Helsinki Institute of Physics	6	92	552
Institute of Biotechnology	7	121	847
Institute of Seismology	6	9	54
Finnish Museum of Natural History			
FMNH/Botanical Museum	3	13	39
FMNH/Dating Laboratory	5	2	10
FMNH/Geological Museum	5	2	10
FMNH/Zoological Museum	4	17	68
	3,73529	34	127

ANNEX I, FACULTY COEFFICIENTS

Defining coefficients

lowest	highest	
4,5	5,8	rating
0,80	1,08	coefficient
1,0		
2,0		
3,0		
4,0		
4,5	0,8000	
4,8	0,8646	
4,9	0,8862	
5,0	0,9077	
5,1	0,9292	
5,7	1,0585	
5,8	1,0800	
7,0		

Assessed impact on the research share of funding

	A	B	C	D	E	F	G
	Research budget	%	Rating	Coefficient	D * B	New % E / SigmaE	Change (E - B) / B
Faculty of Theology	6686	2,75%	5,8	1,08	2,97%	2,97%	8,0 %
Faculty of Law	10629	4,38%	4,8	0,86	3,76%	3,77%	-14,0 %
Faculty of Medicine	51596	21,25%	5,7	1,06	22,52%	22,53%	6,0 %
Faculty of Arts	38757	15,96%	5,7	1,06	16,92%	16,92%	6,0 %
Faculty of Science	61076	25,15%	5,7	1,06	26,66%	26,67%	6,0 %
Faculty of Education	17687	7,28%	5,0	0,91	6,63%	6,63%	-9,0 %
Faculty of Social Sciences	16266	6,70%	5,1	0,93	6,23%	6,23%	-7,0 %
Faculty of Agriculture and Forestry	28362	11,68%	4,9	0,89	10,39%	10,40%	-11,0 %
Faculty of Veterinary Sciences	11783	4,85%	4,5	0,80	3,88%	3,88%	-20,0 %
	242842	100,00%			99,97%	100,00%	