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**The Research Councils in the Nordic Countries – Developments and some Challenges**

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# Preface

This overview of the research council organization in the Nordic countries was commissioned by the Nordic Council of Ministers. The study was finished in early September 2001. Accordingly, the announced proposals for changes and reorganizations in the funding organization in Denmark and Iceland are not dealt with at any great length.

The focus in the report is primarily on the research council system as such. Some other major funding agencies and foundations (semi-governmental) have to some extent been included in order to give a better picture of the public funding organizations.

The report also gives some historical background from the postwar period in order to explain the present funding system. In conclusion, the report also discusses some problems and challenges ahead.

Oslo, December 2001

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# Abstract\*

All the Nordic countries have research councils. Such public funding agencies for research were established during the Second World War in Iceland and Sweden; after the war a considerable number of councils were set up in the other Nordic countries.

The research councils soon became important channels for public support of research – particularly research in the universities. Significant organizational changes have taken place over the years, particularly so in the 1990s. In this report we shall give an overview of the present council structure in the Nordic countries including emerging innovation agencies and semi-governmental foundations. We also include some important features of the debates on council structure in the postwar years – and point to some future problems and challenges in research funding

The history of the research councils in the Nordic countries might be described – in a sweeping statement – as fifty years of success. We conclude by asking: Will there be another fifty years of the same?

We start out with a discussion of what is or may be included in the research council concept: What, indeed, is a research council?

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\* In addition to written material, the study benefits from long time contracts with the development in research policy in the other Nordic countries. For this report I am particularly grateful to the following colleagues in the other Nordic countries for comments to a draft version of this report: Hanne Foss Hansen, Karin Dahl-Jørgensen, Stein Larsen and Anders Korsgaard in Denmark, Anneli Pauli and Esko-Olavi Seppälä (Finland), Vilhjálmur Lúdvíksson (Iceland) and Olle Edqvist (Sweden).

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# What, indeed, is a Research Council?

Research is funded by public authorities through many channels and agencies – including research councils. It is, however, not always entirely clear what the term signifies. Research councils constitute a fairly heterogeneous group, which changes over time. This also applies to the Nordic countries. Traditionally, the councils have been particularly important in the funding of university research with emphasis on disciplinary and basic research. In this role they are often seen as part of a ‘dual funding’ system – an extra budget based on national competition for grants supplementing the budgets of the institutions where the research is carried out. They are intermediary bodies between the research performing level and the Government.

For a start we will refer to some definitions and statements with bearing on the research councils. We will then go on to an outline of some categories that may be of particular relevance to the situation in the Nordic countries.

Arie Rip has defined ‘research council’ as

[...] a generic term denoting a body or net of bodies, which mediate between state patronage of fundamental and strategic research, and the research world itself: the world of scientists, their immediate institutions, and the research going on there. (Rip, 1994).

A report from an international conference in Paris in 1991<sup>1</sup> on the changing role of research councils outlines three basic features that are common to councils in all OECD countries:

- they are the institutions through which the scientific community is entrusted with the autonomous management, based on peer review, of government funding specifically allocated to scientific research: their relationship with governments has often been described as an arm’s-length relationship;
- their organisation and *modus operandi* correspond to a principle of autonomy within science: they primarily support individual scientists or teams on the basis of unsolicited proposals, and their organisation largely corresponds to a structure by disciplines, university departments and chairs;
- as national institutions, they represent national autonomy in science.

Recently, Helga Nowotny et al. stated briefly in their “Mode 2” inspired book “that the European research council system has been run by scientists for the benefit of

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<sup>1</sup> Organised by the OECD and the French *Centre National de la Recherche Scientifique* (C.N.R.S.)



science”. (Nowotny et al., 2001). Now the authors see major changes in the research councils.

Rip’s definition as well as the latter two descriptions obviously regard basic research as the primary task for research councils and self-governance as their primary mode of operation. But there is an important difference – the OECD/C.N.R.S. report and Nowotny et al talk about autonomous management by the scientific community while Rip points to mediation. He also mentions strategic research.

Lord Rothschild, who studied and assessed research funding in Britain in the early 1970s, saw basic research as the appropriate task and arena for the strongly autonomous British research councils at the time. In his view, applied research was not a task for them. Applied research should be funded differently – on a ‘customer-contractor’ basis. Accordingly, Lord Rothschild suggested that some of their funding – corresponding to the applied part of their portfolios at the time – should be taken away from the existing councils (Rothschild, 1971).

The scope of the research that should be funded through the councils has in fact been an issue more or less continuously in most countries. The problem has not always been stated as such, however. The issue has more often been the opposite of the Rothchild view. Many councils have also been encouraged or even instructed to engage in oriented/targeted research. This issue is closely linked to what groups should control the councils and the role and involvement of the academic scientific community in applied research in particular.

### **Political control and scientific self-governance: Two examples from the US and the UK**

This was clearly illustrated when the National Science Foundation came into being in the early post-war years in the USA. In his famous report to the President, *Science, the Endless Frontier*, Dr Vannevar Bush argued for strong federal involvement in research funding in all corners of society (Bush, 1945). He wanted to bring together responsibility for research – basic as well as applied – in one organisation, a National Research Council, with great autonomy and directed by scientists. But no such organisation was established in Washington. The kind of contract between science and society that Bush advocated was in fact never written, though some analysts seem to assume that it was.

A new and important organisation was indeed set up after a while, the National Science Foundation, but its scope was to all intent and purpose limited to basic research. Furthermore, the foundation was placed under direct federal control in the sense that the President of the USA appoints its director. What Bush had envisaged was in fact a kind of academy with a leader elected by the scientists themselves. President Truman could not accept this principle; after all, federal money was involved. His veto put off the establishment of the council with several years (Price, 1954). Furthermore, ministries and agencies started funding and organising

research in their areas of responsibility. The outcome was an essentially pluralist and sectorial system, in considerable contrast to Bush's centralist and broad blueprint for an organisation run by the scientific community.

In Europe, the research council system emerged in the UK around the First World War. Important principles for this system were laid down in 1918 by a government committee chaired by Lord Haldane. First of all, the committee placed considerable emphasis upon the need in Government for access to what it called 'intelligence and research'. According to the committee, this phrase embraced all kinds of statistical data together with scientific research in the form of results from past and ongoing work as well as initiatives for new research projects. Furthermore, the report distinguished between research that was needed for the specific purposes of a particular department, and research that was "for the general use of all departments." In the latter case, responsibility to Parliament should be placed in the hands of a minister who "in normal times is free from any serious pressure of administrative duties, and is immune from any suspicion of being biased by administrative considerations against the application of the results of research." The aim was to avoid that the Government found it "inconvenient to support certain kinds of research, or to publish or use the results." This sentence is the essence of what later has been called 'the Haldane principle of research council autonomy', for long a guiding principle in UK for research funding.<sup>2</sup> In the 1960s the research councils came under the Ministry of Education; their total budget is, however, still called 'the science vote'.

When the Office of Science and Technology (OST) in the late 1990s was moved from the Ministry of Education and Science to the Ministry of Industry, the Haldane principle was indeed done away with, though a 'fencing off' of the OST from the rest of the Ministry was intended. The new arrangement of having a special director general in OST to deal especially with the six British research councils may be of equal importance.<sup>3</sup>

The importance of independence and an arm's-length relationship in research funding was actually demonstrated in the 1970s. The Thatcher government disliked the Social Science Research Council and wanted to dissolve it entirely. Lord Rothschild was asked to look into the matter; to the Government's surprise he concluded as follows: "It would be too much to expect Ministers to show enthusiasm for research designed to show that their policies were misconceived. But it seems obvious that in many cases the public interest will be served by such research being undertaken." (Rothschild, 1982)

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<sup>2</sup> All quotes from (Gummett, 1980).

<sup>3</sup> The actual effect of this arrangement is not widely known.

## A definition and some categories

In Europe a research council organisation emerged in most countries in the early post-war years.<sup>4</sup> In principle the new organisation was tied in with the apparatus of government in terms of mandate, resources and appointment of council members. In practice, the scientist enjoyed considerable autonomy in many of these new councils; by and large the government gave the scientific community a major role to play. However, the ‘social contract’ was not without strings attached, as several contemporary analysts will have it. (Guston and Kenniston, 1994)

In most countries a sizeable proportion of government research funding is now channelled through research councils, particularly to the university and basic research ‘end’ of public R&D funding. The council term is not only used for this part of the funding spectre – they do, however, not usually include a significant ‘development component’, hence their proportion of total Government R&D funding normally do not dominate the R&D budgets.<sup>5</sup> The term research council is sometime used in a broader meaning than alluded to in the definitions we referred to initially as we shall return to below. However, the former category are the most numerous. We also note that many other important funding bodies have been introduced – with broad sectorial innovation responsibilities as we have seen in recent years.

The councils are difficult to describe in straightforward terms, and practice and terminology vary considerably among countries. On the whole, however, we may define a research council as:

- a public body,
- essentially concerned with research,
- influenced by scientists (to varying degrees), and
- with considerable authority within broad budget ceilings and budget specifications (‘line items’) to fund research through grants and otherwise.

The two last items are the most significant and sensitive in this definition. It is in particular in this respect the council system have experienced changes in recent years – as we shall return to many times.

For simplicity’s sake we may divide the heterogeneous group of research councils and more or less similar research-funding agencies in the Western world into two broad categories; one category being *university-oriented councils*<sup>6</sup>, usually in-

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<sup>4</sup> Some organisations were established prior to the war – e.g. in UK and France (C.N.R.S.)

<sup>5</sup> There are exceptions – the National Institute of Health in the US, for example.

<sup>6</sup> They may equally well be seen as councils for basic research or disciplinary councils, though pinpointing what should be understood as a discipline is in no way trivial. We choose ‘university-oriented’ as the more fitting term, though recognising that it may

fluenced by considerable autonomy and ‘bottom-up’ initiatives within the scientific community, the second category being user-oriented and essentially ‘top-down’ with a *reasonably well-defined mission* or responsibility within an area of government (agriculture, energy and so on). The categories differ particularly with respect to overall mission and representation from the scientific community. The influential Swedish report on funding of R&D (1999) introduced a very similar distinction between “science oriented councils” (vetenskapsorienterad forskningsråd) and “area /target oriented research councils and agencies” (områdeorienterade forskningsråd och myndigheter).

Councils of the first category (i.e., university-oriented) are currently the more common and have in essence considerable similarity in structure and operations. They have responded differently to developments and challenges in recent years, however. Diversity is still much greater among the mission-oriented councils. They are on the whole also fewer. Furthermore, we observe that since the research councils were introduced in Britain at the time of the First World War, university-oriented councils in most countries have had considerable autonomy under the aegis of a Ministry of Education (and Science) as part of a dual-funding system for the universities. Obviously the emphasis on autonomy (as exemplified by the Haldane Committee) has had a bearing. Most, but not all, mission-oriented councils report to their respective sectorial ministries.<sup>7</sup>

At the same time, there may exist government agencies which fund significant amount of R&D without having ‘research’ explicitly included in their name or designations. In the Nordic countries, the national innovation agencies in Finland (Tekes) and Sweden (Vinnova) are particularly noticeable in this connection. In addition, separate research committees/councils serving a single ministry often exist in varying degree in all the Nordic countries.

The influence of the scientific community in these councils is usually considerable, through scientists on numerous council committees, peer review mechanisms etc. though the scientists’ actual role does vary, in numbers and influence.<sup>8</sup> By and large such influence is more limited in mission-oriented councils and agencies in which ‘users’, representatives of society at large, and the councils’ own management play a greater role – a point to which we shall return.

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better characterise the more academic values and disciplinary approach in the universities some years back than the emerging breadth of activities in many universities.

<sup>7</sup> A notable exception was the Norwegian Research Council for Applied Social Science (1987-93), which reported to the Ministry of Education and Science.

<sup>8</sup> The role of the staff differs in at least two ways; in the mission oriented councils is usually greater than in the university-oriented councils. In the latter type it may also vary considerable by country – in the US highly scientifically qualified temporary staff play a major role in NSF, etc.

The second category, the mission-oriented councils, is more heterogeneous than the first and its importance varies greatly among countries. Some councils do operate in both spheres – a classical example is to what extent we talk about a research council for medicine, or medicine and health, or health only.<sup>9</sup> This point is particularly evident in Norway after the merger of the former councils in 1993 (Skoie, 2000). The increasing number of oriented and top-down programmes tend to blur this distinction even further. Interestingly enough, the traditionally autonomous British research councils got explicit mission statements in 1993 (UK, 1993). These are, however, still stated in rather general terms.

While the university-oriented councils are usually part and parcel of a dual funding system for university research, the second category is essentially mission-oriented, serving a mixture of research communities: researchers, government laboratories, industry and public authorities. It may actually be difficult to decide what bodies to include in the second category; the designation 'research council' may be used somewhat arbitrarily or even be misleading.<sup>10</sup> According to the definitions given above, the mission-oriented councils are clearly different from the disciplinary councils we have alluded to in the definitions we presented at the beginning. In practice this category often have considerable similarities to government and semi-governmental agencies with a broader mandate than R&D. Tekes, the Finnish innovation agency, is a noticeable case in point as we already have alluded to.

The university-oriented councils are the most numerous and exist in most OECD countries nowadays. They may again be divided into two subcategories, one comprising *umbrella organisations* with several rather autonomous sub-councils (research boards/research divisions, etc.) reporting to a joint board that again reports to a ministry (usually the Ministry of Education and Science). Examples are the newly formed Swedish Research Council, The Academy of Finland, the former NAVF in Norway, Deutsche Forschungsgemeinschaft, and the Dutch NWO.

The second subcategory is comprised of *several parallel university-oriented councils*, each concentrating on a broad disciplinary area like natural science, medicine, the humanities or social science, and each council reporting directly to the ministry. The current British and Danish councils belongs to this category while the Swedish reorganisation in 2001 moved the organization from this category to the umbrella type when the four disciplinary councils were included in an umbrella organisation, the Swedish Research Council (Vetenskapsrådet). The latter have three disciplinary

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<sup>9</sup> To what extent this council should be attached to a ministry of health or of education/science has occasionally been an issue. The world's largest research council – the NIH in the US – is actually attached to the US Department of Health.

<sup>10</sup> Occasionally, the term is used for an entirely advisory body for research – as is presently the case in the Danish terminology: "Danmarks forskningsråd" is not a research council which is correctly reflected in the English translation – the Danish Council for Research Policy

sub-councils. The actual budget procedures and interventions by government through line items in the budget, etc. may in practice complicate this picture. Once more we will stress that these categories – and the distinction between disciplinary and mission oriented councils – is indeed a simplification, an aid for explaining a very heterogeneous research organisation. In our classification we are particularly concerned with the ‘point of gravity’ in tasks and operation of the organisation.<sup>11</sup>

Finally, we may underline some basic justifications for channelling funding through research councils: i) as a supplementary funding channel promoting plurality, ii) generating nation wide competition for grants, with iii) increased flexibility and speedy redistribution of funding, and iv) as vehicles for national initiatives and priorities.

We shall now turn to the research council organisation in the Nordic countries; its emergence as well as the present systems in each of the five countries will be covered. Our account is limited to funding agencies with an emphasis on research councils – purely advisory councils and bodies are not included. We will also include in passing some other funding bodies with national responsibilities that are associated with or clearly related to the council system. They are, however, not treated systematically to the same degree. Entirely private foundations are not included.<sup>12</sup>

What we aim at is essentially drawing up a macro picture. The actual work and developments within the councils are only treated to a very limited extent. Considerable transitions have also taken place in recent years in the Western world research policy and in council operations and procedures in particular – the picture changes over time. (Cozzens et al, 1990)

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<sup>11</sup> Research councils for agriculture are often difficult to classify, for example.

<sup>12</sup> They are of particular importance in Denmark (e.g. the Carlsberg Foundation) and Sweden (e.g. the Wallenberg Foundation).

# The emergence of research councils

## The founding years

Research councils are essentially a post Second World War phenomenon in the Nordic countries. Obviously some public funds had been channelled to research before the war, in most cases on an ad hoc basis, however.<sup>13</sup> It seems fair to point to the National Research Council established in Iceland in 1940 as the first research council in the Nordic countries. The Icelandic council was essentially set up to help prepare Iceland to survive isolation during the war. Applied research in several new laboratories was a key objective for the three council members. Accordingly, the Council was of an applied and mission-oriented type. In 1957 a separate Science Fund was created to give financial support for scientific training and research. The fund included committees for the humanities/social sciences and natural sciences – and at a later stage also for medicine.

The war also triggered the establishment of the Technical Research Council (TFR) in Sweden in 1942. This council was attached to the Ministry of Commerce. Soon after the war followed additional councils for medicine (1945), natural science (1946), social science (1947), and the humanities (1959) – all attached to the Ministry of Education. A research council for agriculture was also soon established (1945), attached to the Ministry of Agriculture. In 1960, Sweden got another mission-oriented council; the Research Council for Building Research. (SOU, 1975).

In Norway, three councils were established in the early post-war period, two essentially mission-oriented councils – for natural science and industrial research in 1946 (the NTNF), and for agriculture in 1949 (the NLVF). A general university-oriented council comprised of sub-councils for natural science, medicine, social science and the humanities (NAVF) was also founded in 1949 (Skoie, 1984).<sup>14</sup> The first two councils were attached to the ministries of industry and agriculture respectively, the NAVF council to the Ministry of Education. The funding source provided for the councils was somewhat unique: part of the profits from football pools were channelled their way, and for many years this type of financing played a major role in the funding of Norwegian science and scholarship.

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<sup>13</sup> Some of them had, however, an embryonic research council character. Foundations initiated by the scientific community and established with partial government sponsorship were most common at the time.

<sup>14</sup> Actually, the NAVF also included a sub-council for 'psychology and youth issues' during its early years, deliberately initiated to meet a government interest in the field.

In Finland, the National Commission for the Humanities, and the National Commission for the Natural Sciences were both established in 1950. New commissions were gradually introduced; in 1970 there were six. More importantly, these six commissions were assembled under the umbrella of a Central Board of Research Councils in a major reorganisation in 1970. An administrative office for the Board and the councils were also established. The old Academy of Finland was at the same time abolished, but the name was maintained for the new entity consisting of the Central Board and the six councils together. The number of commissions was extended to seven in 1983 when a commission for environmental research was introduced.

Denmark took an important initiative in this area when the Technical-Scientific Research Council was established in 1946 by Folketinget, Denmark's parliament. The Council was attached to the Technical Academy (ATV). (Grönborg, 1996) In 1952, the State Fund for Science was established, its five disciplinary subgroups covering essentially all university research. In 1968 Denmark established research councils along the lines of the other Nordic countries essentially based on the existing structure.

The initiatives to introduce research councils were by and large welcomed in the scientific communities in the Nordic countries. A noticeable and interesting exception was the proposal for a social science research council in Sweden immediately after the war. The government's first proposal was actually withdrawn due to resistance by some leading social scientists, among them Gunnar Myrdal, a noted economist as well as a leading Labour politician. The opponents argued that direct government funding of research would imply unacceptable state intervention and influence which might distort the autonomy of the research community (SOU, 1975; Nybom, 1997). These early initiatives to include the social sciences and the humanities in the research council system in all the Nordic countries are noteworthy, however. A *Wissenschaftstradition* in these countries was obviously influential in this matter. Also the proposal for a medical research council was initially resisted in some parts of the universities in Sweden; its opponents wanted more funds channelled directly to the faculties of medicine instead. (Nybom, 1997)

The scientific communities and the universities in particular were numerically well represented in the new councils. To what extent this should be the case, and who should select the members, was discussed publicly in some cases. The relationship between the councils and the scientific societies was an issue in Norway as well as in Sweden. The Norwegian Academy of Science and Letters wanted more say in the selection of members to the university council (the NAVF), but was not listened to by government.<sup>15</sup> The universities normally had the right to nominate the greater part of the council members with the government usually approving

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<sup>15</sup> In principle, this dispute has similarities to the debate over the Bush report in the US prior to the establishment of NSF.



their nominations without changes, though it had reserved for itself the power to overrule the universities on this matter. In addition, the government usually appoint a small group of council members without research background and without a formal external nomination procedure.<sup>16</sup>

## Major developments

The research councils soon became important institutions and actors in the public research organisation in most OECD countries. This was also the case in the Nordic countries – probably more so in Iceland, Norway and Sweden in the beginning than in the other two countries. The councils were given considerable autonomy in their support of research and research initiatives. By and large they soon achieved high esteem in the scientific community and in government, they were often consulted, and had a central place in the research organisation.

Proposals to modify or extend the council system in order to establish more councils were launched at times over the years. Some fields or research areas wanted a bigger share of the limelight, or specific interest groups argued for separate and visible councils.<sup>17</sup> More often than not, governments turned down proposals for new councils, the reasoning being that the existing councils should absorb such initiatives in order to avoid too many organisations.<sup>18</sup>

However, the council organisation was discussed and significantly changed at times. In Sweden, a major overhaul of the system took place in the mid 1970s through the work of an important government commission (SOU, 1975). Difficulties with the existing set-up were thought to be of at least two kinds: controversies over membership composition of the councils and vague responsibilities for multi-disciplinary research and certain types of applied/targeted research. At the time, research issues were of course strongly influenced by the ideology of ‘the events of 1968’.

The revised organisational mode suggested by the Swedish commission may be interpreted as a deal or compromise. The essence of the new structure was three disciplinary councils (natural science, medicine, humanities/social sciences) on the one hand, essentially run by elected members of the scientific community through an elaborate electoral system at the universities, and on the other hand an interdi-

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<sup>16</sup> For some councils the government also appointed the chairperson, in others the council had the right to elect its own chair.

<sup>17</sup> In an instance of this, some well-connected Norwegian Social Democrats advocated strengthening applied social science as a means of bolstering the welfare state (Skoie, 1984).

<sup>18</sup> At one point, a “Foundation for Marketing and Distribution Research” was established as a substitute for a research council in the field in Norway.

disciplinary body (not designated research council) with a majority of MPs and trade unionists (the Swedish Council for Planning and Co-ordination of Research – FRN). Accordingly, the influence of the scientific community was preserved in three disciplinary councils while society at large dominated FRN.

The three councils were primarily supposed to support basic research. The election by the scientific community of the majority of council members in the three councils was in principle a significant change which strengthened the scientific autonomy of the councils, as its majority was elected solely by and among researchers. In the same vein was the introduction of the post of Chief Scientific Officer, to be filled by an academic of professorial rank ('huvudsekreterare'). The council was also empowered to select the chief scientific officer – an important element in the autonomy of the new research councils.

In connection with the three-hundredth anniversary of the Bank of Sweden, a foundation for support of research was set up in 1962 to commemorate the event and to advance "an important national cause". The Bank of Sweden Tercentenary Foundation (Riksbankens Jubileumsfond) is supposed to support "major, long-term research project" and under its charter, special attention shall be given to new research tasks "requiring prompt and swift action".

The executive board has a majority of representatives from Parliament. In principle all fields of research may be supported. After some initial public debate, the Foundation choose to give particular support to research in the humanities and social sciences. Actually the new foundation soon became a dominating source of funding in these fields.

In the area of technology, an important new organisation was established by the Ministry of Industry in Sweden in 1968: the National Board for Technical Development, i.e. STU, Styrelsen för teknisk utveckling. The Technical Research Council (TFR) was integrated in the STU – as was also some other technical agencies. The idea was to form an innovation agency that could play an important role in the development of Swedish technology and industry as part and parcel of the Social Democrats' offensive for an 'active industrial policy'. However, this high-profile policy initiative soon ran into difficulties. In addition severe complaints of declining support for basic engineering research emerged in the research community, and proposals were soon tabled for re-establishing a technical research council. In 1990, a new council of this kind actually emerged. The Swedish Research Council for Engineering Sciences (TFR) – attached to the Ministry of Industry. (At the same time, a Research Council for Social Research (SFR) was attached to the Ministry of Health and Social Affairs). Equally important was a broad reorganisation, which transferred STU to NUTEK – The Swedish National Board for Industrial and Technical Development - in 1991.

A major issue evolving over years in Norway was the establishment of a research council for applied social science, particularly as an intermediary for research sponsorship by government ministries. An interesting political cleavage appeared

on the issue in the 1970s; a government proposal for a *research council for social planning* was defeated in the Storting, Norway's parliament. The left-wing Socialist Party saw the proposal as too technocratic while the Conservatives saw it as too socialistic. However, the Storting did accept that a council approximately of the same type was established as a sub-council of the existing NAVF council.<sup>19</sup> Less than ten years later, this sub-council formed the core of an independent research council for applied social science (NORAS). The council was meant to work closely with the many institutes of applied social science in Norway and the ministries involved in developing welfare policies in a broad sense. (Skoie, 1991)

The set-up of a separate mission-oriented research council for fisheries (NFFR) in 1972 in Norway was a less controversial issue. Accordingly, Norway came to have five research councils, four of which were mission-oriented. Government interest in applied and targeted research was in fact running high in the 1960s and 1970s. The technical (and, indeed, much else besides) council, the NTNF, was a particularly strong force at the time, and some saw the organisation as an agency for future organising the greater part of Norwegian mission-oriented research – possibly outside the family of research councils (Skoie, 1991). This gave rise to a long-standing cleavage in Norwegian research policy between the applied and technology oriented communities and the NAVF/universities. This cleavage more or less broke up the government's science advisory committee at the time. (Skoie, 1991)

The research council organisation Denmark got in 1968 was comprised of six councils, each for a major scientific/scholarly area. The basis was the five commissions mentioned earlier and the Technical Research Council. They all reported directly to the Ministry of Education.<sup>20</sup> In the latter part of the 1980s, the council structure re-emerged on the agenda. A reduction to three or four councils was advocated by central authorities, but rejected by Parliament.

In Finland, the Academy of Finland was – as mentioned above – turned into a research university-oriented council in 1970 after a major reorganisation by the Government. In 1983, a research council for environmental research was included as a separate commission in the new Academy organisation. Agriculture/forestry remained with the Academy ("the science vote") – as was the case in Denmark.

In Iceland, the National Research Council was reorganised and strengthened in 1965. It got a proper project funding function in 1985 through the establishment of the Technology Fund. In 1987 the Science Fund was changed into a Science Council.

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<sup>19</sup> This arrangement has in principle some similarities to the RANN programme (Research Applied to National Needs) included in NSF in 1970s.

<sup>20</sup> To the new Ministry of Research from 1993. Agricultural research remained in this Ministry as was the case in Finland - in contrast to Norway and Sweden.

## A comparative note

At the end of the 1980s, all the Nordic countries have university-oriented research councils, to a varying degree also strongly influenced by representatives of the academic community. The Swedish electoral system for council members introduced in the 1970s is particularly noteworthy and an expression of a strong emphasis in Sweden on basic research and autonomy.

These councils were affiliated with the ministries of education; their funding may be seen as being of the ‘science vote’ type in the British terminology. They were different in numbers, however. In Finland and Norway the councils were single umbrella organisations (the Academy of Finland, and the NAVF) while the councils for the major scientific/scholarly areas reported directly to the Ministries of Education in Denmark, Iceland and Sweden. In these countries, each council was entitled to a separate budget decided upon by Parliament. This meant that allocations for natural science, medicine etc. were decided at the political level. By contrast, in Norway the decision on how to split the budget was made by the board of the NAVF and was often a matter of controversy (Skoie, 1984). The budget specifications (“line items”) and instructions were by and large modest at the time.

We also find some councils that clearly are mission-oriented councils in the Nordic countries in addition to councils which may be classified either way. We also note that Norway and Sweden had mission oriented councils for agriculture while Denmark and Finland’s effort was organised as university councils. It is, however, a smaller and more heterogeneous group. This was particularly evident in the Norwegian case: fairly independent councils with essentially applied mission were linked to the ministries of industry (NTNF), agriculture (NLVF), fisheries (NFFR), and education and science (NORAS). As mentioned, the NTNF developed an increasingly broad mission serving several ministries and establishing and running many national labs and institutes. This council was strong for years and served as an important meeting place which many government officials greatly enjoyed attending (Collett and Skoie, 1981).

The actual workings of the councils show considerable similarities, particularly in the emphasis on grant applications and priority-setting in the university-oriented councils – a dominating activity in these councils (‘the fund function’ in Danish terminology). Scientific initiatives and science policy advice have also been among their tasks. Scientific advice in the sense of ‘science in politics’ has, however, been less strong in most countries.

Naturally, the mission-oriented councils have been closer to applications and various government policy sectors. In practice they have often acted as an important meeting ground between the research community and practitioners in government, industry, industry associations etc.. New research programmes and institutes have been initiated from time to time and several applied institutes have been attached

ched to a research council of this kind, particularly in Iceland and Norway in the early years.

At the same time the emergence of innovation agencies with broad mandates in areas of technology and industry in Finland (National Technology Agency - Tekes) and Sweden (STU/NUTEK) is particularly noteworthy. It may also be fair to say that the NTNF organisation was under-way in this direction in the 1960s and 1970s. The transfer was not completed, however.<sup>21</sup>

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<sup>21</sup> The follow up to the Long Term Plan in 1964 (“the Red Book”) ran into difficulties which made a mark. More important, the new Government measures suggested, were organized separately.

# Recent changes; present system

## The turbulent 1990s

Throughout the 1990s, there were significant discussions of and changes within the council system in the Nordic countries. To some extent Finland is an exception; the Academy of Finland and the National Technology Agency (Tekes) have enjoyed a fairly stable life apart from some discussions and a significant reduction in number of councils and changes in procedures within the Academy. In contrast, Sweden experienced a continuous flow of commissions dealing with government funding of research and the council structure in the aftermath of the 1994 introduction of several new research foundations based on capital accumulated in the 'wage earners' foundations<sup>22</sup>, a process resulting in a considerable increase in the number of important funding sources/actors; public and private. The merger in 1993 of the existing Norwegian research councils into one single council was a swift, but indeed a radical and controversial action. Iceland also created one single council through a merger in 1994. Recently, the Icelandic minister has announced further changes in the research organisation. (Nytt om Nordisk Forskningspolitik 9/2001).

In Denmark, several proposals for change have been put forward over the last few years, but proposals for mergers between councils were defeated in Parliament in spite of the fact that it only meant mergers of university-oriented councils. Linking up the agricultural and technical councils with their respective ministries was aired in an OECD review (OECD, 1994). Recently, a major assessment of the Danish research organisation has been carried out by a government commission and significant changes have been proposed. Furthermore, the Ministry of Trade and Industry has been rearranged by the new Government which took office in late November 2001. This may effect the public innovation organizations considerably.

A dominant issue in these years has been the number of councils and other funding agencies. In Sweden this became particularly the case after the introduction of new foundations based on 'wage earners' foundations' in 1994. A large number of funding actors in these small countries are often seen as inefficient. Accountability and efficiency have come to the forefront. A large number of councils are also seen as less appropriate for tackling emerging generic fields like biotechnology,

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<sup>22</sup> A politically controversial mandatory profit-sharing scheme designed to empower employees (acting through their union representatives) by block shareholdings in private-sector companies.

material science, IT etc. It is important to avoid sub-critical efforts; a strategic consolidation is needed as the cost of facilities and equipment increases. (“the sophistication factor”)

Furthermore, the ‘knowledge society’ and wealth creation have become imperatives. Innovation and ‘relevant’ research is the order of the day, and top-down initiatives and targeted research programmes and centres follow suit. There is less room for bottom-up initiatives and tension often arises, probably the most so in Denmark in recent years. We will now go into the most significant recent discussions and changes in some detail.

## Norway

In Norway, the government’s proposal to the Parliament in 1992 for a reorganisation of the research councils was preceded by a report from a government commission that proposed a merger into one single research council comprising the activities of all five existing councils (i.e. one university-oriented and four of the applied and mission-oriented type). The original proposal envisaged three sub-councils within the new single council, essentially divided according to disciplinary lines and with council members appointed by the government along with the Board membership.<sup>23</sup> At the same time, the report stated rather vaguely that parts of the NTNF’s (i.e. the technical council’s) activities might be diverted from the merged council.<sup>24</sup> As it turned out, however, this was to be a full merger of all five councils, except for responsibilities for public procurement contracts. The new council was supposed to support R&D in all three sectors: industry, institutes<sup>25</sup> and universities, hence it was hardly surprising that the government essentially opted for mission-orientation and strong user-representation in the sub-councils rather than the structure essentially suggested by the commission. This was also the case for appointment procedures, internal divisions, lines of responsibility and so on. We will go into this in some more detail below (Skoie, 2000).

The explicit arguments for the proposed merger emphasised the importance of a simple structure, attached to only one ministry, but serving all sectors of government through an efficient system under a unified leadership. It was argued that a single council would facilitate international co-operation in research, including participation in the EU Framework Programme. Scientific reasons were also given

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<sup>23</sup> This mode of organisation would have given the three sub-councils greater *de facto* autonomy than in the ‘integrated’ council which finally emerged, and also more similarities to university-type councils.

<sup>24</sup> This was also three times the largest council in budget terms at the time.

<sup>25</sup> The institute sector are the relative largest one among the Nordic countries.

for the merger; the progress in important generic technologies such as biotechnology called for doing away with old demarcations, hence the preference for one funding agency. Furthermore, and not least important, the importance of integration of basic and applied research was emphasised, as was the need to cut administrative expenses.

The commission did not discuss explicitly what should be the scope of the new council; the scopes of the existing councils were as we have seen de facto taken for granted.<sup>26</sup> The report did state that the Vannevar Bush era was over and that a new social contract for science was emerging. It did not, however, go into great detail on the scope of activities or on the very idea of a research council – what a body of this kind should amount to, nor was there much of discussion of how the new Council was to differ in actual mode of operation from its predecessors.<sup>27</sup>

The Research Council of Norway, established in 1993, has six rather unorthodox sub-councils/research divisions, all with their own research boards comprised of researchers and users, and all appointed by the main executive board of the research council. The six sub-councils are as follows:

- Industry and Energy (including oil, shipping and service industries)
- Bio-production and Processing (i.e. fisheries, aquaculture, agriculture, veterinary medicine, forestry and food industry)
- Environment and Development
- Culture and Society (the humanities, social sciences, public administration and services)
- Natural Science and Technology
- Medicine and Health

The Research Council has an executive board with eleven government-appointed members drawn from broad segments of Norwegian society (“knowledge of society, industry and research” is required), which in turn appoints the members of the six research boards that we already have alluded to. This means by the same token that Norway to a great extent has departed from the tradition of having one or more university oriented councils. The appointment procedure for research council members used in most countries has also been abolished. According to the rules the research boards are supposed to have “users” as well as “researchers” as members (no numbers specified). In the periode 1993-2000 a little more than half

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<sup>26</sup> The establishment of an innovation agency along Finnish and Swedish lines appear not to have been discussed explicitly.

<sup>27</sup> Here we may see the seeds of the clashes that were to break out within the new councils. Two models were in fact presented, and their inherent conflicts not discussed. (Skoie, 2000)



of the members in the Executive Board and the Research Boards were affiliated with a research institution. The significant difference to the former organization is the composition of the NAVF-organization which was heavily dominated by researchers in the university council tradition.<sup>28</sup>

The ministerial attachment to the Ministry of Education, Research and Church Affairs is not entirely straightforward. It is important to note that the council also receives regular funding and guidance from several other ministries; notably the ministries of Industry, Energy, Agriculture, Fisheries, and the Environment – actually the ‘council owners’ in “the old system”. In Table 1 we notice that the largest part of council funding comes from the Ministry of Industry.

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<sup>28</sup> For details see Forskningspolitikk 3/2001 p. 10 and Forskningspolitikk 4/2001 p. 28.

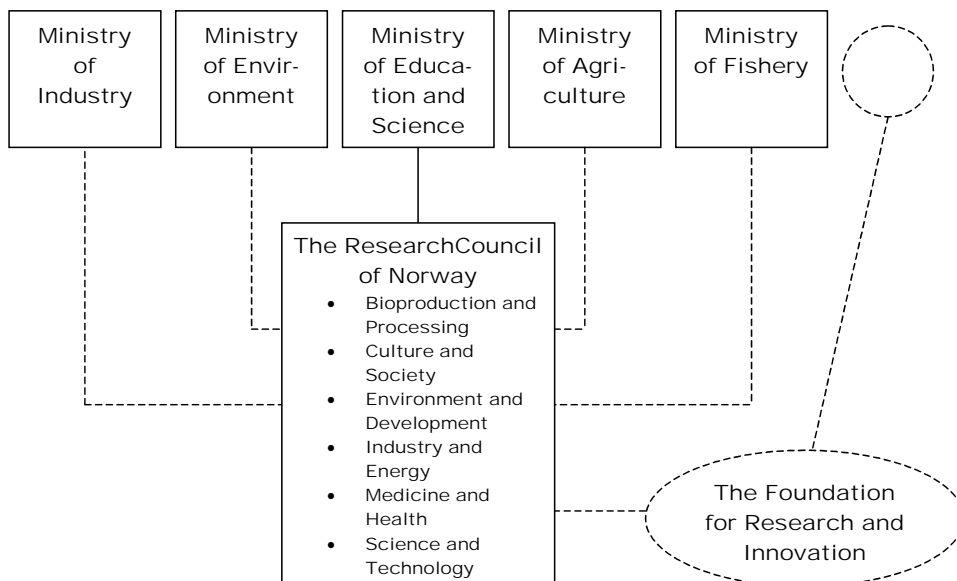
**Table 1** Appropriations for the Research Council of Norway by government ministry, fiscal budget 2001

<i>Ministry</i>	<i>Million NOK</i>
Education, Research and Church Affairs	842
Industry	923
Energy	181
Fisheries	210
Agriculture	260
Environment	198
Fund for Research and Innovation*	204
<i>Total**</i>	<i>2,816</i>

\* The first allocation from the new Foundation was given in 2000.

\*\* The grand total is somewhat larger.

**Figure 1** Research councils/funding agencies 2001 in Norway



Accordingly, the Council's budget is strongly influenced by these six ministries – including expectations and guidance.<sup>29</sup> Furthermore, the ministries' actual funding of the Council – which to a large extent implies their relative strength in important council matters – has changed only slightly over the years. The Council also takes on additional programme and project funding from other ministries as well, normally on a contract basis.

This leaves the Council's executive board with little room for manoeuvring on important budgetary matters: the Council's budget is comprised of budget specifications ('line items') which the Board have to accept – the board is not free to allocate and spend money freely to any great extent (not subject to zero sum dealing) – the strings attached are considerable. This practice has obviously made it difficult to meet the envisioned objective of an integrated and unified organisation. At the same time it is hard to imagine a radical different funding arrangement for a council of such great scope within an essentially sectorial funding system.<sup>30</sup>

**Table 2** *Research councils and other national funding agencies in Norway in 2001*

<i>Name</i>	<i>Founded</i>	<i>Ministry</i>	<i>Budget</i>
The Research Council of Norway*	1993	Education**	3174
Sub-councils			
Industry and Energy			690
Bio production and Processing			562
Environment and Development			332
Culture and Society			467
Natural Sciences and Technology			728
Medicine and Health			251

\* In addition, the reorganisation of the SND in 1993 may to some extent be seen as the set-up of an innovation agency. In 2000 the R&D component amounted to 300 mill. NOK.

\*\* Six ministries give regular appropriations to the Council – see Table 1. In addition, the new Foundation for Research and Innovation (2000) channels the income from its endowment to the Council – see Table 1.

### **A new funding source – the Foundation for Research and Innovation**

In the spring of 1999, the Storting adopted a proposal for a new Foundation for Research and Innovation, its endowment coming from proceeds from privatisation

<sup>29</sup> The appointment of members to the main executive board for example.

<sup>30</sup> In the merger debate in the Storting, a zero sum approach was actually assumed in the Committee report – but not implemented by the Government (apart from small adjustments).

of state-owned companies. Privatisation efforts used to be modest in Norway; this has recently changed rapidly.

The government has opted to charge the Research Council of Norway with allocating funds for research on the basis of the foundation's income. However, in the 2002 Budget, the Government proposes to allocate one third of these funds directly to the universities. Reasonably enough, the Research Council welcomed this. The foundation is meant to supplement regular government R&D funding and secure more stable and long term funding of research. Problems may arise, however, since the foundation's objectives are stated rather vaguely: Is funding essentially meant to take place in 'the basic end' or is industrial innovation/technology meant to be the main objective?<sup>31</sup> This is particularly important since the Government has announced a strong increase in the Foundation's capital. At the same time these funds may, according to the Government's guidelines, be taken into consideration in the overall funding of R&D. A prominent member of the 1990-91 committee proposing the merger, Professor Francis Sejersted, has lately suggested (in *Forskningspolitikk* 2/2001) that the new Foundation should be kept separate from the Research Council and concentrate on basic research, and by the same token reduce the present centralist and monolithic character in Norwegian research funding – greater diversity is needed.<sup>32</sup>

### Uncertain future?

In addition to its broad scope and dominating mission orientation, the new Research Council has two other unusual features aside from being a funding council. First, it is also supposed to serve as an umbrella organisation for the majority of government laboratories and research institutes/establishments of various kinds, more than sixty institutions in all, and provide floor funding, guidance, evaluation and so on for these institutions. This is no simple task. The units are a mixed bag with great diversity in their missions, and some ministries still finance and otherwise exercise considerable influence over many of them. Second, as already mentioned, the Council is also meant to serve as an advisory body to the government, thus filling the gap when the last national science policy advisory council was abolished in 1988.

During the course of its first years the Council has become fairly controversial. The government recently initiated an international evaluation of the Council – expected to report in December 2001. Accordingly – we may envision an important debate in 2002 on two major issues in Norway; the Research Council as well as

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<sup>31</sup> The Norwegian name: *Forskning og nyskaping* – actually a compromise in the Bondevik cabinet where two alternatives were launched (support of basic research and alternatively innovation/technology).

<sup>32</sup> Professor Sejersted elaborated extensively on this point in an interview in *Forskningsforum* 9/2001.

the new Foundation for Research and Innovation – including the link between them.

## Denmark

Denmark currently has six research councils. They go back to 1968 (the technology council has roots back to 1946) and are essentially university-oriented councils (less so for Agriculture and Technology).<sup>33</sup> Two other university-oriented and specialised bodies also exist: the Danish National Research Foundation and the Danish Research Training Council.<sup>34</sup> The latter is a specialised agency for postgraduate education and training – especially at doctoral level.

Denmark has experienced some controversies related to the research councils in recent years; to what extent the number of councils should be reduced and merged has been a central issue. However, proposals to reduce the number of councils have so far been defeated in Folketinget, the Danish parliament. Interestingly enough, a proposal to merge the councils for the humanities and the social sciences was particularly strongly resisted. An increasing tendency in the Research Ministry<sup>35</sup> to take a top-down approach to the councils through budget specifications and ministerial initiated programmes has generated considerable resistance in the scientific community and the existing councils in particular. The establishment of a separate foundation for basic research, *the Danish National Research Foundation*, in 1991 also led to discussions. The existing councils wanted to avoid having a new body – they wanted to channel the extra money through the existing councils. The Ministry of Research has also occasionally wanted a greater say over the new and fairly independent Foundation.

In addition to the research councils, there is the Industry and Trade Development Council – an agency under the recent Ministry of Trade and Industry funding R&D since 1973. It is essentially an innovation agency somewhat in line with Tekes in Finland, but considerably smaller. A separate Council for Technology Service also exists. In the spring of 2001 a major overhaul of the Ministry's efforts in this area has taken place – including introducing a separate Innovation Council. Following the general election in November 2001, the Ministry of Trade and Industry was dissolved and its portfolio split between the Ministry of Economy and the Research Ministry. The latter Ministry once again got a new name – Science, Tech-

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<sup>33</sup> A strong top-down element in recent years by the Ministry is noteworthy, however.

<sup>34</sup> Formerly The National Research Academy.

<sup>35</sup> The name and scope of this ministry has changed several times since the introduction in 1993 – presently: Ministry of Information, Technology and Research.

nology and Innovation. Accordingly, “the innovation side” in Denmark is presently under considerable reorganization.

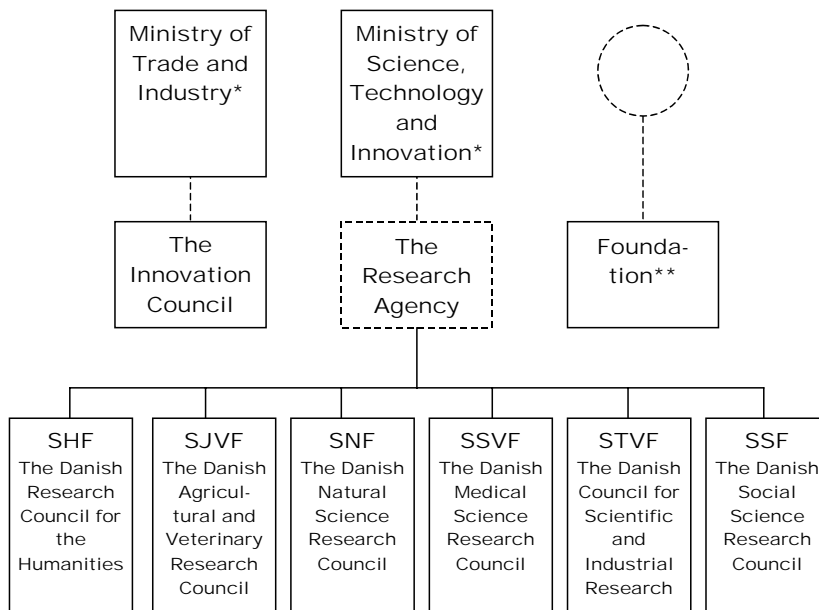
The research councils have been less powerful in Denmark than in Norway and Sweden. Relatively speaking, their resources have been more modest and their secretariats smaller; their closeness to the Ministry has also meant limitations on council initiatives and reduced credibility in the university community.

Each of the Danish research councils consists of a chairperson and at least 14, at most 18 members. According to the statute “a large majority” of the members have to be researchers “ensuring the broadest possible professional representation and the most thorough research competence.” All members are appointed in personal capacity by the Minister.

Since the mid-1980s the Government have required the research councils to develop and present long-term strategy plans for their activities. This procedure has been an important element in funding of research programmes and of particular importance in the competition for extra funds in the State Budget. In practice this procedure and other government initiatives have introduced a strong element of Government top-down planning in the council activities through earmarked programme initiatives, etc. (‘cigar boxes’ in the local parlance).

The Government has recently strengthened the integration and leadership of the secretariats for the six councils through forming a joint secretariat – The Danish Research Agency (Forskningsstyrelsen) – including the appointment of a Director to head the Secretariat. The Government has also made other efforts to bring the councils closer together in order to improve co-operation and integration. The former Board of the Council-chairs has been extended to include ‘outsiders’ appointed by government. (“Forskerforum”) and has been given some advisory as well as operational functions. So far, this forum has met considerable difficulties in getting off the ground; its first chairperson resigned after a short period in office. It seems to be difficult for outsiders to match the expertise and commitment among the active council members. These efforts obviously deliberate seek to encourage greater co-operation and integration across council borders – short of having a single council of university and ‘umbrella’ type.

**Figure 2**      *Research councils/funding agencies 2001 in Denmark*



\* The ministry of Trade and Industry was merged with the Ministry of Economy when a new government was formed in November 2001. The Ministry of Research was also renamed at the same occasion. The new name is Ministry for Science, Technology and Innovation

\*\* The Danish National Research Foundation

The plans for changing the council structure the last decade has failed. Apart from adding 'health' to the name of the Medical Research Council, none of these proposals have so far succeeded. The central idea in all these proposals has been to cut down the number of councils to three or four, though merging the two councils for the humanities and the social sciences has in fact been the proposal most effectively done away by the Folketinget. In 1994, it was suggested in an OECD review that the agricultural and the technical research councils should be transferred to the respective ministries and accordingly becoming closer to mission oriented councils (OECD, 1994).

Table 3 below lists the councils and their budgets in 1998.

**Table 3** *Research councils and other national funding agencies in Denmark 2001*

<i>Name</i>	<i>Founded</i>	<i>Ministry</i>	<i>Budget (2000)</i>
<i>A. Research councils</i>			
Natural Science Research Council	1968	Research	149.7

Medical Research Council	1968	Research	196.9
Agricultural and Veterinary Research Council	1968	Research	54.6
Social Science Research Council	1968	Research	65.6
Research Council for the Humanities	1968	Research	67.3
Council for Scientific and Industrial Research	1968	Research	105.2
<i>B. Related bodies</i>			
National Foundation of Basic Research	1991	Research	224
FUR – Research Training	1986	Education	96
<i>C. Innovation agency</i>			
The Danish Agency for Trade and Industry / Council for Technology Service / The Innovation Council	(1973)	Industry*	

\* Merged with the Ministry of Economy in Nov. 2001 and some parts transferred to the Research Ministry.

The Danish Agency for Trade and Industry belongs to the Ministry of Industry and is primarily concerned with innovation and technology. At present, there is a particular focus on SMBs and the technology institutes and centres in Denmark are seen as valuable tools for them to draw on. As already noted, significant changes in the organisation and efforts were introduced in the spring 2001.

## Related organisations

In the early 1990s, the privatisation of state-owned companies provided extra moneys that the government, with the Ministry of Finance in the lead, decided to spend on basic research. A new, independent National Foundation for Basic Research was established as a separate entity from the research councils. The traditional councils were not too pleased with this new organisational arrangement – they wanted some sort of integration with the new foundation as we already have alluded to.

The foundation has chosen to support research in a way that is different from the traditional grant applications procedure subscribed to by most university-oriented councils. It concentrates on supporting entire research groups ('centres of excellence') for a period of five years ('block grants') after international peer review of group applications. Surprisingly, this non-egalitarian, quite elitist approach has not yet been much challenged in Denmark. It may be added that the independent character of this foundation has occasionally been challenged by the Ministry of Research; the organisation was seen to be out of their sphere of influence.<sup>36</sup>

The Danish Research Academy – in 2000 renamed The Danish Training Council - was established in 1986 with responsibilities for co-ordinating postgra-



duate education in Denmark. The Academy's immediate objective was to improve the training of researchers both in terms of quantity and quality, and increase the number of internationally 'competitive brains' at the doctoral level. Grants for studies abroad and funds for guest professors and scholars to supervise in doctoral programmes in Denmark were among the Academy's first efforts. In 2000 the Academy was renamed and transferred to the Ministry of Education. The secretariat is still a part of the Danish Research Agency.

### **Changes in the air?**

The commission mentioned earlier that reviewed research and university organisation in a broad sense reported in early fall of 2001. The Commission propose a kind of an umbrella organization for the university oriented councils – including the Danisk National Research Foundation. At the moment, the councils financial prospects seem somewhat bleak. (Danish Research Agency, 2001). The councils take some relief, however, in statements made by the former minister of research, Birte Weiss, who promised to scale down the unpopular top-down element in council funding. This is also an important element in “the Agreement 2000 on Research” in Parliament.<sup>37</sup> At the same time, the many changes at the helm of the Ministry of Research and in the government research and university organisation make it particularly difficult to foresee future developments in Denmark.<sup>38</sup> The significant extension of responsibilities for the Ministry of Research – now Ministry for Science, Technology and Innovation – may lead to organizational changes for the research councils as well as the innovation apparatus.

## **Sweden**

In Sweden, a decision by the Conservative government in 1994 turned the endowments of the Wage Earners' Funds into several independent research foundations out of direct government control. Accordingly, several new funding actors entered the scene; considerable additional resources were at the same time made available for strategic research and postgraduate training. Seven such foundations are now to varying degrees involved in research funding. In Table 4 we have included the

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<sup>36</sup> This tension seems to have been particularly fierce while Frank Jensen was minister in the mid-1990s (Rostrup-Nilsen, 2001).

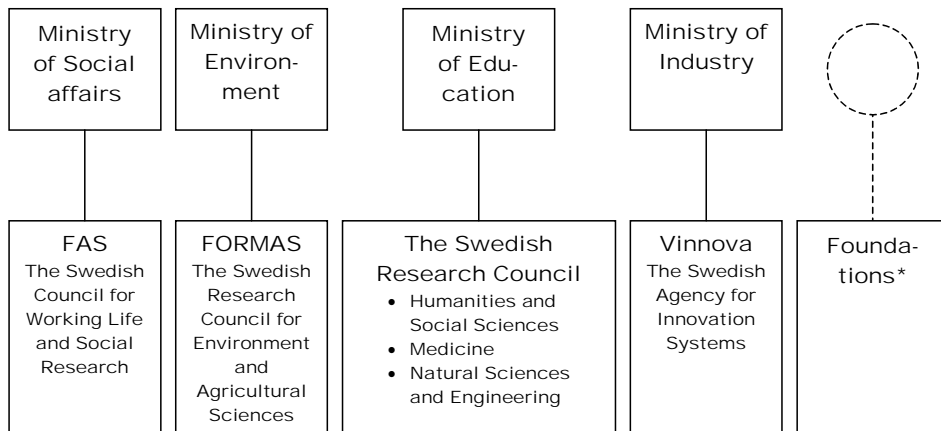
<sup>37</sup> This was actually an agreement between all the major political parties and the Government.

<sup>38</sup> The Research Ministry has obviously experienced difficulties in finding their role in research policy vis-à-vis other ministries – including the Ministry of Education (they were merged for a while).

major ones. This triggered efforts to reduce the total numbers of funding bodies in Sweden and to introduce some government say over the foundations. This led to a sharp controversy between the Conservative Party and the Social Democratic Party.

At the end of the battle 1998, Professor Hans Wigzell, science advisor to the Prime Minister, chaired a small commission on research funding which led to a government decision to modify the funding organisation. Cutting down the number of funding bodies while keeping discipline-oriented and mission-oriented research funding apart was the guiding principles. They stated explicitly that “there is a limit to how far merging activities make sense” (Swedish Ministry of Education, 1999). The four major university-oriented councils were organised under an umbrella organisation: the Swedish Research Council (Vetenskapsrådet). Two applied and mission-oriented research councils were established by reshuffling several councils and committees serving various sectors of society. They became attached to separate ministries (FAS – Ministry of Social Affairs, and FORMAS – Ministry of the Environment).<sup>39</sup> Finally, a new agency came into being, VINNOVA, based on parts of NUTEK and essentially charged with promoting innovation, much along the lines of Tekes in Finland.

**Figure 3**      *Research councils/funding agencies 2001 in Sweden*



\* Several semigovernmental foundations which support significant amount of research exist in Sweden, see Table 4

<sup>39</sup> This means that research in agriculture now is attached to the Ministry of Environment.

The Swedish Research Council is attached to the Ministry of Education with its executive board appointed by the government. The majority is elected by the scientific community, however. Inside the new organisation we find three subcouncils ("ämnesråd"); for the humanities/social sciences, medicine, and natural science/technology. The merger of the formally separate councils for science (NFR) and technology (TFR) respectively was probably the most significant move in this connection. It is also important to note a relatively large representation from the scientific community has been maintained both at board and sub-council level and that the electoral procedure also has been in the new organisation in the new Research Council. Also the budget specification by the Government for the three major disciplinary areas has been kept. This means that Sweden now has moved to an umbrella type of university oriented research councils.

In the two mission oriented councils; FAS (The Swedish Council for Working Live and Social Research) and FORMAS (The Swedish Research Council for Environment and Agricultural Sciences), half of the 13 member Board are researchers elected by the scientific community. The other half is appointed by the Government. In both councils, the day to day operations are led by a Chief Scientific Officer (huvudsekreterare). Vinnova has no specific research representation – the Government appoint the members of the Board and the Director General along the lines of Government agencies in general.

In Table 4 below, the new Swedish organisation is listed.

**Table 4** *Research councils and other national funding agencies in Sweden in 2001*

<i>Name</i>	<i>Founded</i>	<i>Ministry</i>	<i>Budget</i>
<i>A. University-oriented research councils</i>			
The Science Research Council	2001	Education	1777
Sub-councils			
Humanities/Social Science			213
Medicine/Health			347
Natural Science/Engineering			1000
<i>B. Mission oriented councils</i>			
FAS	2001	Social Affairs	261
FORMAS	2001	Environment	473
<i>C. Innovation agency</i>			
VINNOVA	2001	Industry	1000
<i>D. Semi-governmental foundations</i>			
Bank of Sweden Tercentenary Foundation	1962	Parliament	350
The Swedish Foundation for Strategic Research	1994		750*
Mistra	1994		287*

KK	1994	168*
STINT	1994	108*

\* Figures for 1968.

The system with a Chief Scientific Officer is kept in the three sub-councils within the Swedish Research Council. It is also worth nothing that the government still decides on the budget figures for each sub-council. The new innovation agency, VINNOVA (the Swedish Agency for Innovation System) is based on a part of NUTEK and is attached to the Ministry of Industry.<sup>40</sup> At the same time it should be added that the fierce political cleavage in relation to the foundations seems to have calmed down after the government has gained great influence over the appointments of the executive boards of the foundations. Accordingly, we may be justified in classifying the foundation as semi-governmental bodies.

## Finland

The overall Finnish funding organisation has not been much changed in recent years. The Academy of Finland, a broad university-oriented research council, and a strong innovation agency (the National Technology Agency, or Tekes) are the two major pillars in public funding of R&D in Finland.

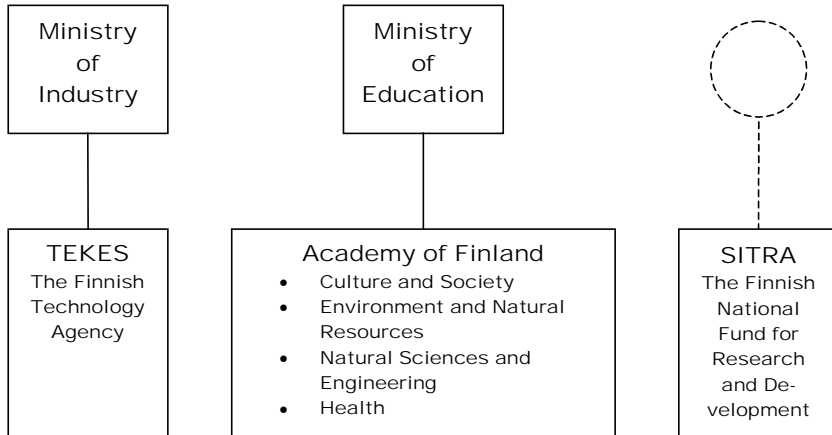
Until 1994, the Academy of Finland had the following seven scientific commissions (also named research councils, in analogy to the sub-councils of the former NAVF in Norway); humanities, natural science, medicine, agriculture and forestry, technology, social science and the environment. The last one was added in 1983 and renamed Environment and Natural resources in 2001.

From 1989 through 1994, the tasks and organisation of the Academy were discussed. The discussion was initiated by a report from a ministerial commission reviewing basic research. This commission advocated a reduction in the number of scientific commissions (i.e. research councils) from seven to three. A more proactive and strengthened Academy under the leadership of an Executive Board with a chairperson appointed by the President of the Republic and with a secretary general with scientific background was also suggested for each commission. An international evaluation panel studying the Academy of Finland also contributed to this discussion in the early 1990s.

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<sup>40</sup> The Minister of Education has a certain role in his capacity as Minister of research.

**Figure 4** Research councils/funding agencies 2001 in Finland



The proposal was stalled for some time, but essentially adopted in 1994 by Riksdagen, the Finnish parliament. The main difference was the acceptance of four sub-councils, not three, as follows:

- Culture and Society
- Natural Sciences and Engineering
- Health
- Environment and Natural Resources<sup>41</sup>

The responsibility for agriculture/forestry was given to the environment council (as in Sweden in 2000) with veterinary medicine going to the council for health. At the same time, responsibility for some disciplinary areas (molecular biology, for instance) is shared by two or more councils.

The Executive Board has seven members, including the chairmen in the four research councils. Each research council has 10 – 14 members, who are appointed after consultation with the research community in particular.

Established in 1983, Tekes has become a strong and influential innovation agency in Finland. Its budget is substantially larger than the budget for the Academy of Finland. In addition, the *Finnish National Fund for Research and Development SITRA* was set up in 1967 as an independent public fund attached to the Finnish parliament.

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<sup>41</sup> Renamed Bio sciences and Environment.

**Table 5** *Research councils and other national funding agencies in Finland in 2001 in mill. FIM*

<i>Name</i>	<i>Founded</i>	<i>Ministry</i>	<i>Budget</i>
<i>A. Research councils</i>			
The Finnish Academy	1970*	Education	1099
Research Council for Culture and Society	-	-	250
Research Council for Natural Sciences and Engineering			289
Research Council for Health			183
Bio sciences and Environment			209
<i>B. Innovation agencies</i>			
TeKes	1983	Industry	2379
SITRA	1967	Parliament	167

## Iceland

In Iceland, the two research councils for Science and Technology respectively, were brought together in one organisation in 1994 – the Icelandic Research Council – RANNIS. The Council has 11 member from the academic community, the institute sector as well as users from industry and elsewhere. The size of the Icelandic population may of course give a good rationale for having particularly few institutions of this kind, though the merger was not applauded by everyone at the time.

The former councils remained essentially within RANNIS as grant committees<sup>42</sup> for basic research and technology respectively. They report to the Council, which formally approves all grants. At the same time these committees experience considerable autonomy.

The Minister of Education, the minister with responsibility for RANNIS, has in 2001 announced that he intends to propose changes in the research apparatus – including the advisory as well as the funding mechanism.

In addition to RANNIS, two related organisations have a role in research and graduate education; the Fund for Scientific Facilities and the Fund for Research Training. The latter is served administratively by RANNIS, but is led by a ministerial appointed 3-member board. Table 6 gives an overview.

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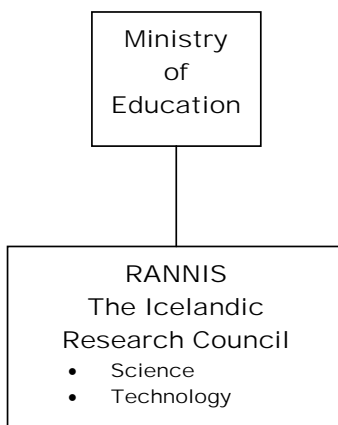
<sup>42</sup> Seven advisory committees – four traditionally disciplinary oriented and three sectorially oriented – also review applications.

**Table 6** *Research councils and other national funding agencies in Iceland in 2001, mill. ISK*

Name	Founded	Ministry	Budget
<b>A. Research councils</b>			
The Icelandic Research Council (RANNIS)	1994	Education	
Sub-councils:			
Basic Fund	1994		210
Technology Fund	1994		200
<b>B. Associated bodies*</b>			
Facilities & Equipment		Education	75
Graduate Training Fund		Education	40

\* These funds are associated with RANNIS and both are administratively served by RANNIS.

**Figure 5** *Research councils/funding agencies 2001 in Iceland*



# The post-war period in perspective

The establishment of research councils and other funding agencies in the post-war period is part and parcel of the great expansion of the R&D endeavour in this period in all the Nordic countries. Government authorities have been instrumental in this development, expanding its involvement in R&D in budgetary terms as well as in scope – in recent years not least as part and parcel of innovation policies. A recent Swedish Commission (Forskning 2000) seems to be representative when it argues that the involvement of the state in research matters should include the following aspects:

- The government shall guarantee freedom of inquiry
- The government's main responsibilities are basic research and research training
- The government's responsibilities include research and development supporting state-run enterprises
- The government will promote research and development for other sectors of society when this is considered the best approach to developing these sectors
- The government will provide an organisational framework for carrying out research
- The government will provide a basis for participation in international research collaboration.

Research councils have in particular been used for the second category of government responsibilities listed above; basic research and research training. The task of funding research according to scientific opportunities and essentially in an "advancement of knowledge" perspective – usually gives the scientific community both the most well defined, familiar and simplest task. The challenge is greater when judgements have to be made of the scientific potential *as well as* of factors that are external to science – 'national needs'<sup>43</sup> and of the likelihood that research can meet such

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<sup>43</sup> In the US, the term 'scientific opportunities and national needs' has emerged from the need to summarise what is seen as the essence of research funding and priority-setting.



needs within a particular time frame. This observation may at the same time explain the extensive use of what we have called the university-oriented councils, and a more uneven and heterogeneous pattern of mission-oriented councils and funding arrangements. The Government is naturally less willing to delegate the assessment of ‘user needs’.

Our review reveals that all the Nordic countries have research councils – both university oriented and mission oriented councils - with considerable experience from the greater part of the post war period. By and large they have had a crucial role in the government R&D organisation, though this varies somewhat by country and over time. Our account shows that mission oriented councils were introduced at an early stage in Iceland, Norway and Sweden.

The council organisation has, however, experienced considerable changes over the years, particularly so in the 1990s. The discussions in the latter period illustrate that neither the research community nor society at large has shown any great familiarity with and interest in issues of this kind. This was most clearly demonstrated in the council merger in Norway in 1993 and in the discussions in Sweden in the aftermath of the conversion of the wage earner funds into research foundations in 1994.

In recent years we have seen an important tendency to introduce agencies that have a broader scope/mandate than R&D and what might be called a mission oriented research council. This is particularly evident in the area of innovation and technology, where it is seen as valuable to have research as well as several other government programmes in one organisation – e.g. Tekes in Finland and VINNOVA in Sweden. It is a consequence of increased industrial competition internationally – and also the downplaying of the ‘linear model’ and emphasis on “a national system of innovation”. Apart from Finland, the innovation/technology area has been surprisingly turbulent in recent years – reorganisations and policy shifts have often surfaced.

What constitutes at any given time an optimal set-up of government funding organisations in the R&D area is no straightforward matter; difficulties and tension seem to appear in most countries whatever solution is chosen. The lack of agreement and operational divisions between basic and applied research generate one set of difficulties. Neither is it always evident where responsibility for public funding should rest in a particular case in modern society – i.e. what ministry should be responsible for funding and guidance. In fact, missions are not always clear-cut. Food production may for example be seen as part of agriculture/fishing/nutrition or as a consumer good. At the same time, government authorities have in many countries increasingly encouraged researchers to concentrate on mission-

oriented tasks rather than on curiosity-driven research, which follow ‘scientific opportunities’/advancement of knowledge approaches.<sup>44</sup>

Such issues may also be seen as part of a traditional bureaucratic power play in government. Occasionally, issues over the control over government research policy lead to feuds among ministries – as was lately the case in Norway and Sweden with the two ministries of education and industry feuding over research policy territories. The bone of contention may, in short, be this: Should an essentially advancement of knowledge/basic research perspective or, in this case, an innovation perspective have the centre stage in research affairs in Government?

Researchers in universities and the university-oriented councils have often advocated that the scientific community should influence the actual spending of sectorial money for research to a greater extent, particularly through peer review assessment of the scientific merit of concrete projects and programmes. Some have advocated leaving the entire responsibility for project selection to the research councils. This issue was at the heart of a particularly articulate debate in Sweden in the 1990s that culminated in the recommendation from the government commission “Forskning 2000” of essentially giving the university research councils responsibilities for greater parts of the ministries’ R&D money (‘sectorial money’). This recommendation was indeed surprising as it came from a committee dominated by parliamentarians.<sup>45</sup>

An interesting question also appears in relation to the budget for the university councils. Who should decide on the overall level of funding for broad disciplinary areas of research like natural science, social sciences, and so on? Ministers and parliamentarians, or the board in umbrella organisations like the Academy of Finland, the Swedish Research Council? The latter category has weak political legitimacy in this matter, but considerable more scientific legitimacy. In most cases this has been a task for Government. The former Norwegian NAVF council was an exception – a fact that occasionally led to considerable controversies within the Council.<sup>46</sup> To day increasing political control through budget specifications (line items) and targeted research programmes are noticeable in the Nordic countries, though not to the same degree in all countries.

Another important current issue is related to what extent the various university councils and sub councils primarily should rely on bottom-up initiatives – i.e.

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<sup>44</sup> The US approach may seem different. This may reflect the fame and prestige of agencies like the NSF and the NIH and the political support they enjoy for supporting basic research.

<sup>45</sup> Probably the group of politicians focused particularly on issues related to the highly politicised wage earners’ foundations.

<sup>46</sup> The Norwegian experience showed remarkable stability – last years distribution was always a firm base. After a short time, the Government decided to specify these funds for the NFR-council.

should they be given a lump sum of money in order to respond to grant applications, or should government specify certain areas and programmes to be funded and given special treatment/attention on a top-down basis? All Nordic countries have experienced considerable tension along this dimension – probably the most so in Denmark in recent years. The new Swedish Research Council also experienced a surprisingly high degree of budget specifications in its first three-year budget.

At the same time, present-day councils are probably not as vital or inspire as much confidence as they used to, though exceptions exist. Their *raison d'être* seems to some extent to have been weakened in an expanding funding structure. One consequence is that the council channel is often seen as just another external source of research money. Accordingly, there may be reason once again to draw attention to the basic justifications, formulated in the early post-war years, for channeling funding through research councils: i) as a supplementary funding channel promoting plurality, ii) generating nationwide competition for grants, with iii) increased flexibility and speedy redistribution of funding, and iv) as vehicles for national initiatives and long term priorities.

We may also see tendencies of the councils developing into bureaucratic organisations with the same elaborate routines as other governmental agencies. “To spot outstanding scientific talent and projects” no longer seems to be on top of the agenda; adherence to deadlines for applications, forms and long-term plans are more important. Even peer review panels now bolster their assessments with dubious counts of publications and citations; contrary to what should be expected by the scientific/scholarly authorities. Present-day councils may actually become more like ordinary government agencies than research councils. The tremendous expansion in the R&D efforts in general through funding agencies and contract in particular, may contribute to this development. The tasks for the councils have become more cumbersome – and less attractive for many. A thorough discussion of their scope, rationale and *modus operandi* has not been central on the agenda most of the time, and greater efforts in this respect might be helpful. This should include a discussion of the relation between the Government and the councils – including various “models of *operandi*” for this relationship.<sup>47</sup>

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<sup>47</sup> Including “the Director General model” for the research councils in the UK.

# Another 50 years of success? Problems and challenges ahead for the research councils

We shall now point to some developments and questions which in general terms may influence the future role and well-being of research councils – i.e. to what extent the council system is kept, expanded in funds or scope, changed in important ways, seen to do well, etc.

## A different policy climate

The general climate in research policy has in important respects changed and even deteriorated in recent years – in my view. It is also the central point in the recent book *The New Production of Knowledge* (Gibbons et al, 1994).<sup>48</sup> The extensive growth and complexities of the R&D endeavour have complicated R&D funding, so has increasing appearance and awareness of ethical dilemmas and other consequences of modern research efforts. At the same time, the people of the *gründer* generation in the formidable post-war R&D build-up are gone, and the cumulative interest and capacity for R&D policies are currently surprisingly modest. So is the broad overview of the R&D complex in the scientific community as well as among politicians. The civil servants and politicians involved seem to find it increasingly difficult to come to grips with research policy. This often gives rise to simple and quick decisions on complex matters that beg for thorough and knowledgeable analysis and consideration. The complexities also imply that many important decisions with strong bearing on R&D *de facto* come as a ‘windfall’ from non-scientific matters.

Furthermore, the increasing importance of market considerations in the public sector leads to significant changes and normally puts pressure on the time frame in research funding. It has become more difficult to keep up a long-term perspective; quick results are often unduly expected. New powerful actors have entered the scene and their expectations and messages are different.

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<sup>48</sup> I do not, though, entirely agree with their description, or with their deterministic interpretation in particular.

## Increased government influence and control?

The government may for various reasons take a greater though less enlightened interest in research funding by continuously stressing the social relevance of research as viewed from a political viewpoint. This may transform the traditional role of research councils in at least two ways – particularly the role of the university-oriented councils.

First, a desire to integrate and make R&D more applicable to problems of particular relevance to society may strengthen the mission approach to research funding – and also imply greater integration of R&D as part of organisations which are dealing with societal problems and innovation in a broad sense. The recent innovation agencies in Finland, Sweden and Denmark are a case in point. Scientific expertise is mobilised in such agencies too, but the scientists have usually a more marginal role than they have in the traditional university councils.

Second, increasing government control often means less bottom-up approach and self-governance by scientists in the university councils. This may be done by introducing more non-scientists on council boards or by encouraging/directing the councils to look primarily for ‘relevance’ through programmes that currently seem important to government or otherwise. By the same token, the government increasingly hopes to mobilise university scientists to take greater interest in problems of this kind in addition to or as an alternative to curiosity-driven research. In recent years we have seen that some governments pay lip service to basic research while public contract work *de facto* carry the day.<sup>49</sup>

Third, the many ethical problems and dilemmas with which modern science – particularly within the biomedicine sphere – confronts society may change and possibly jeopardise the whole concept of bottom-up and curiosity-driven research, the traditional stock-in-trade of university-oriented councils. The ability to assess, mobilise and articulate social responsibility in such matters at an early stage within research funding organisations may be of great importance for the actual development in these institutions. Otherwise the society at large may overreact.

## Research councils – still a viable concept?

It is hard to imagine a modern nation without significant government funding of R&D. However, in most countries the actual assessment and funding of specific research projects/programmes is not seen as a natural task for ‘Whitehall’, the central apparatus of government. In many cases, external bodies such as research councils are seen as more suitable for the role – particularly that of assessing the ‘scientific opportunities’ dimension. An intermediary body of this kind is usually

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<sup>49</sup> This has been the case in Norway in recent years.

more able to possess or mobilise scientific expertise which the central government apparatus finds it hard to recruit or develop. In addition, the need for an arm's-length relationship is often seen as important; political closeness and intervention in all research activities is not desirable.<sup>50</sup> At the same time councils establish trust through channels and links to the research community as well as to government.

The research councils are also increasingly challenged from the research community they are meant to serve, and the view is heard that the dual funding system is on the verge of becoming obsolete. Resources should go directly to the institutions and not be channelled to them via a research council,<sup>51</sup> witness the increasingly intense discussions over overhead charges and the demand for an explicit research policy at the universities. The many large and visible research programmes initiated by the funding agencies may contribute to this development. Generally speaking, the mutual understanding between the councils and the universities seems by and large to have deteriorated in recent years; they both compete for the same government funding and neither their roles nor the established division of labour any longer seem to be quite well understood and respected.

The recent increase in external funding (grants as well as contracts) makes the council one financial source among many. A considerable blurring of the distinction between grants and contracts has a similar effect. Actually, some researchers may prefer to deal with administrators and politicians; decisions may be faster (because of a need to grasp 'scientific opportunities', or the processing of applications less rigorous), the project size bigger, etc. The difference in prestige is rapidly becoming modest. The Framework Programme in EU – essentially an applied/targeted programme – is indicative of this development.<sup>52</sup>

There seems to be a widespread tendency in the research community to sign a research contract of a 'utilitarian' type without much concern for the actual outcome of the research to be conducted. Obtaining resources tend to be the essential part – what is stated in the funding papers, less so.

This is actually about to become a science policy problem: researchers accept money on the basis of external criteria, but ignore this fact in the follow-up procedure. They want their work to be evaluated on the basis of criteria internal to science despite "use" has explicitly been alluded to in the research proposal. Research that seeks its *raison d'être* in use external to science must also accept to be

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<sup>50</sup> Cf. the Haldane principle referred to above, and Lord Rothschild's views on the need for an independent social science council.

<sup>51</sup> This attitude is usually more common in the institutional leadership than among the scientific rank and file. It also varies by country.

<sup>52</sup> Policy makers and information officers in the universities in the Nordic countries have systematically played down this fact in order to be able to 'win back' research money from Brussels.

judged on such grounds. Increasingly, funding authorities may not want to be fooled by the recipients of research money.<sup>53</sup>

Several factors could explain this. Traditionally, research is given considerable freedom and the benefit of doubt by the funder; the wording is often only meant to give an indication of the direction of the research effort. At the same time, the university community has a strong tendency to look upon research outcome essentially in terms of papers in international journals.<sup>54</sup> To what extent can we expect the utilitarian statements in future research proposals to be blurred over or neglected by the funder or society at large? Should we come to expect evaluations that carefully compare the research aims and the actual outcome to a much greater extent than present practice? At the same time, mission oriented councils and agencies with vague and general objectives have recently been criticized. They "contract research without a real contractor", according to Sverker Gustavsson (Forskningspolitikk 3/2001).

## Picking scientific winners by committee?

The awarding of grants by committees dominated by scientific peers is occasionally called into question – also in the scientific community. Peer ability to judge and select the most promising ideas and grant applications is challenged in at least in two ways:

- i) The most radical and innovative ideas may be overlooked in reviews of this kind. It is claimed that eminent scientists like Einstein or Bohr would not have succeeded in a modern research council in their early careers. A group of peers is usually better at identifying and weeding out low quality applications than at seeing the radical new ideas, according to this claim (Science, 1979, Friedman, 2001).
- ii) It is also claimed that peers tend to support existing disciplines and sub-disciplines. They are often hesitant to recognise emerging disciplines and sub-disciplines, they are biased toward their own areas of expertise and can hardly form a reliable opinion on cross-disciplinary and broad areas. Peers are in this respect seen as a conservative group – either because in all honesty they are not able to see the potential in an emerging field, or because they *de facto* do not want to allow more competitors access to the same funds. (Benner and Sandström, 2000) Discrimination towards women is another claim along the same lines (Wold and Werneaa, 1997).

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<sup>53</sup> COM (1992) 682, p 44.

<sup>54</sup> This is apparent in many evaluations of research in recent years.

- iii) Peer review and expertise in general do not always carry the same authority today as it used to. The prestige of the experts has declined; other groups claim attention to a greater extent.

## **The burden of the competitive grant**

Others claim that the existing grant applications procedures have become too burdensome for the research community, requiring an immense amount of paper work. Greater competition for funds adds to this. Accordingly, applications are time-consuming for the applicant and involve considerable management resources – including the time and effort of peer groups.

The strong egalitarian values in the Nordic countries also tend to generate modest grants, as many applicants share the money available. This may at the same time strengthen the individualistic approach in research. Accordingly, some argue for larger grants, preferably awarded to leading scientific entrepreneurs ('block grants') and concentrated in centres of excellence and research programmes. In the 1990s we have seen considerable efforts in this direction in all the Nordic countries. To what extent these efforts have been successful is another matter.

## **Competent council members and peers?**

Science is seen as increasingly specialised and fragmented. These developments make it harder to keep a broad overview and outlook of larger fields and segments of research – including cross- and inter-disciplinary developments. This makes the work of the research councils more difficult. Assessment of applications may increasingly become a rather ritual and conventional exercise with strong emphasis on track record and on numbers rather than expert assessment of publications and projects (Seitz, 2000).

This tendency may in fact be strengthened by a parallel tendency to broaden the membership of council boards and similar bodies. Broader recruitment does not necessarily imply broader expertise and overview of the R&D complex; it may actually weaken the scientific judgement represented. Emphasis on track record and bureaucratic routes may *de facto* be the result.

## **A proactive council?**

Assessing and funding grant applications in a bottom-up manner or through programmes often tend to become the dominant task in most research councils. They are, however, usually expected to have proactive approach as well. Initiatives of a



purely scientific nature are expected – for instance, in order to initiate and strengthen a particular field/institution or an emerging field. This may also include initiating research with application in mind.

A research council is also expected to give advice to society and public authorities on scientific matters – solicited or not. A council is also supposed to see the scientific endeavour in a broader perspective, paying attention to ethical issues and dilemmas at an early stage in the science-and-society sphere – i.e., to study and discuss consequences of scientific activities and issues related to science and society. In short, they are expected to contribute to a sensible research policy that goes beyond the narrow perspective “of being able to feed more scientists”.

## **Growth versus freedom and bottom-up initiatives**

The public purse has come under strain in most countries in recent years. This means a levelling-off in the funding for research and, more important, much greater competition.<sup>55</sup> It is a challenge to adjust to this situation and to be able to keep some flexibility in particular. Despite the sizeable resources already committed to R&D, this is in practice no easy task.

For many reasons I think that large areas of research in the Western world must accept that the formidable post-war growth is over, or at least levelling off. Many problems within research can no longer be solved through measures that assume growth. The size of the enterprise of basic research has obviously reached a level undreamed of by Vannevar Bush and most science policy advisers in his time.

The pressure on the university councils is now considerable in most countries. This also applies for the Nordic ones, as we have seen. The question is to what extent the scientific community is also prepared and able to fight for a funding channel that still gives significant room for bottom-up initiatives with or without application in mind. A more pertinent question is whether society at large is willing to accept a channel of this kind.<sup>56</sup> We have already noted a tendency in the research community to accept funding based on external criteria, but in practice to ignore this dimension when the research is up for evaluation. Research assessment exercises become essentially one-dimensional, with strong emphasis on publications as we already have alluded to. In the long run this practice may backfire.

In my view the dichotomy in our definition between researcher-initiated research on the one hand, and user or socially influenced research on the other,

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<sup>55</sup> E.g. the cost of research (“the sophistication factor”) and the increase in number of scientists.

<sup>56</sup> Gibbons et al. obviously has a different view on this important point. They neither defend a bottom-up channel nor see it as a successful strategy.

should be the basis for peaceful competition rather than an either/or attitude. It is more important for the spokesmen of basic research to monitor developments in their own resources and working conditions and the general well-being of their fields than to compare with and envy developments in applied research and experimental development. The objectives are different and should be viewed and assessed as such.

The essential point should be to sustain vital basic research of high quality. In my view, further expansion of resources for basic research is less important than securing good working conditions for the research activities that already exist and are able to make a real contribution. The wealthy Western countries of today should be able to maintain and finance research that does not only promise short-term usefulness. The amount of resources going into this endeavour is in the end a political question, and it will help that some research “stands up honestly” as basic research and does not sail under false colours.

## **‘The Nixon trap’**

It is not in the long run for the politicians to go it alone! Scientific judgement is important and should not be avoided. The Nixon trap (“Mr President: You can cure cancer!”)<sup>57</sup> is to be avoided, and the fact that research results normally do not materialise immediately should be borne in mind. In addition one should not ignore the value of independent research as a source for society to draw upon for advice. To what extent are the councils and society at large able to maintain and renew this source and build necessary bridges? Obviously this is a particular challenge for the small Nordic countries.

One could certainly argue strongly that there is still need for research councils. They increase national competition for research funding and fellowships, i.e. ‘dual funding’ within broad national strategies for example. However, the relative strength of the council channel – what researchers should expect from the university and council budgets respectively – is a difficult issue that for too long has not been properly dealt with.

A first priority is to maintain trust in the council system – including the research community. This relates to scientific decisions taken by the councils as well as their dealings with the authorities on procedural and priority issues.

We are surely not arguing that basic research is the superior kind of research, or that peer-reviewed ‘bottom-up’ initiatives always succeed. Our concern is that research not intended to be directly useful at the time of funding, but with a long-term advancement of knowledge perspective as its legitimate basis also should be

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<sup>57</sup> President Nixon’s ‘Cancer Crusade’ in the early 1970s is usually seen to have failed due to lack of scientific opportunities at the time of the research effort.

adequately funded by government, preferably at arm's length. Up until now it has been obviously valuable, also from a user perspective, not to put 'all eggs in one basket' by abolishing bottom-up initiatives in the scientific community, which indeed represent only a modest percentage of total public funded R&D.

This defence of basic research certainly does not imply that all university research should be of this kind, or that universities should live in splendid isolation. However, today's universities are the proper home for the greater part of basic research activities that society wants to fund. A well-designed research council system may still be the most appropriate way to maintain the well-being of such research and, at the same time, to maintain the universities as institutions of considerable independence and integrity in modern society.<sup>58</sup> It goes without saying that the mission oriented research councils also have important roles to play.

## A sombre note

Surprisingly enough, the academic leadership has only paid modest attention to important science policy issues in recent years – included questions related to basic research. Funding and principles for funding are among such issues, which include the rationale for research councils, the size and role of the council system, and the government practices with regard to budget specifications and top-down initiatives of various kinds.

This also begs the question to what extent the funding system in the small Nordic countries should be multiple-source or monolithic? Recent developments have indeed made Norway and Sweden contrasts in this respect. Is this contrast too large at present? Even if we do want it: how much diversity can small countries like the Nordic in the long run afford? On the other hand: It could be strongly argued that one should accept that there are major cleavages even in a small country, and that it would make sense to accommodate such cleavages institutionally. In other words: Putting all research activities – including technology and innovation, in one basket may be too much.

To defend basic research/bottom-up funding in the small egalitarian Nordic countries may be particularly tricky, as the contributions made here to the world's stock of knowledge will always remain marginal. Politicians may argue that the responsibility for the advancement of knowledge rests with the major countries. Hence the academic leadership face even greater challenges if they want to develop and sustain research of this kind.

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<sup>58</sup> See for instance the recent debate on the danger of loosing integrity in several editorials in *Nature* devoted to this issue in August/September 2001.

# Accronyms used for research councils and other major funding agencies in the Nordic countries in the post-war period\*

AFR	The Council for Atomic Research. Sweden (1959-1977). Atomforskningsrådet.
BFR	The Council for Building Research. Sweden (1960-2000). Byggforskningsrådet.
B/F	Bioproduction and Processing, The Research Council of Norway (1993). Bioproduksjon og foredling, Norges forskningsråd.
DTVF	The Danish Research Council for Science and Technology (1960-73).
FAS	The Swedish Council for Working Life and Social Research (2001). Forskningsrådet för Arbetsliv och Socialvetenskap.
FORMAS	The Swedish Research Council for Environment and Agricultural Sciences (2001). Forskningsrådet för miljö, areella näringar och samhällsbyggande.
FRN	Swedish Council for Planning and Coordination of Research (1977-2000). Forskningsrådsnämnden.
HFR	The Research Council for the Humanities. Sweden (1947-1977). Humanistiska forskningsrådet.
HSFR	The Council for Research in the Humanities and Social Sciences. Sweden (1977-2000). Det humanistisk-samhällsvetenskapliga forskningsrådet.

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\* There are acronyms for most councils etc., through not for all.

I/E	Industry and Energy, The Research Council of Norway (1993). Industri og energi, Norges forskningsråd.
IRC	The Icelandic Research Council (RANNIS – the Icelandic abbreviation – is most often used) (1994).
KK	The Knowledge Foundation. Sweden (1994).
K/S	Culture and Society, The Research Council of Norway (1993). Kultur og samfunn, Norges forskningsråd.
Ky	The Research Council for Culture and Society, Academy of Finland (1994).
LL	Research Council for Environment and Natural Resources. Academy of Finland (1994).
LT	Research Council for Natural Sciences and Engineering, Academy of Finland. (1994).
MFR	The Medical Research Council. Sweden (1945-2000). Det medicinska forskningsrådet.
M/H	Medicine and Health, The Research Council of Norway (1993). Medisin og helse, Norges forskningsråd.
Mistra	Foundation for Strategic Environmental Research. Sweden (1994).
M/U	Environment and Development, The Research Council of Norway (1993). Miljø og utvikling, Norges forskningsråd.
NAVF	The Norwegian Research Council for Science and the Humanities (1949-1992). Norges allmennvitenskapelige forskningsråd.
NFFR	The Norwegian Research Council for Fishery (1972-1992). Norges fiskeriforskningsråd.
NFR	The Research Council for Natural Science. Sweden (1947-2000). Statens naturvetenskapliga forskningsråd.
NFR	The Research Council of Norway (1993). Norges forskningsråd.

NLVF	The Norwegian Research Council for Agriculture (1949-1992). Norges landbruksvitenskapelige forskningsråd.
NORAS	The Norwegian Research Council for Applied Social Science (1987-1992). Norges råd for anvendt samfunnsforskning.
N/T	Natural Science and Tecnology, The Research Council of Norway (1993). Naturvitenskap og teknologi, Norges forskningsråd.
NTNF	The Norwegian Council for Scientific and Industrial Research. (1946-1992). Norges teknisk-naturvitenskapelige forskningsråd.
NUTEK	The Swedish National Board for Industrial and Technical Development (1991). Närings- og teknikutvecklingsvärvet.
RANNIS	The Icelandic Research Council (1994).
RFSP	The Council for Social Planning, The Norwegian Research Council for Science and the Humanities (NAVF) (1977-1987). Rådet for samfunnsplanlegging, Norges allmennvitenskapelige forskningsråd.
RHF	The Research Council for the Humanities, The Norwegian Research Council for Science and the Humanities (NAVF) (1949-1992). Rådet for humanistisk forskning, Norges allmennvitenskapelige forskningsråd.
RJ	Bank of Sweden Tercentenary Foundation (1962). Riksbankens Jubileumsfond.
RMF	The Medical Research Council, the Norwegian Research Council for Science and the Humanities (NAVF) (1949-1992). Rådet for medisinsk forskning, Norges allmennvitenskapelige forskningsråd.
RNF	The Research Council for Natural Science, the Norwegian Research Council for Science and the Humanities (NAVF) (1949-1992). Rådet for naturvitenskapelig forskning, Norges allmennvitenskapelige forskningsråd.
RSF	The Research Council for Social Science, The Norwegian Research Council for Science and the Humanities (NAVF) (1949-

	1992). Rådet for samfunnsforskning, Norges allmennvitenskapelige forskningsråd.
SFR	The Social Science Research Council, Sweden (1948-77). Statens råd för samhällsforskning.
SFR	The Swedish Council for Social Research (1990-2000). Socialvetenskapliga forskningsrådet.
SHF	The Danish Research Council for the Humanities (1968). Statens Humanistiske Forskningsråd.
SITRA	Finnish National Fund for Research and Development (1967).
SJFR	The Swedish Council for Forestry and Agricultural Research (1945-2000). Skogs- och jordbrukets forskningsråd.
SJVF	The Danish Agricultural and Veterinary Research Council (1968). Statens Jordbrugs- og Veterinærvidenskabelige Forskningsråd.
SND	The Norwegian Industrial and Regional Development Fund (1993). Statens Nærings- og Distriktsutviklingsfond.
SNF	The Danish Natural Science Research Council. Denmark (1968). Statens Naturvidenskabelige Forskningsråd.
SSF	The Danish Social Science Research Council (1968). Statens Samfundsvitenskabelige Forskningsråd.
SSVF	The Danish Medical Research Council (1968). Statens Sundhedsvidenskabelige Forskningsråd.
STINT	The Swedish Foundation for International Cooperation in Research and Higher Education (1994).
STU	The National Board for Technical Development. Sweden (1968-1991). Styrelsen för teknisk utveckling.
STVF	The Danish Council for Scientific and Industrial Research (1973). Statens Teknisk-Vitenskabelige Forskningsråd.
TEKES	The National Technology Agency. Finland (1983).

TFR	The Swedish Council for Engineering Sciences (1990-2000).
TFR	The Technical Research Council (1942-1968). Statens tekniske forskningsråd.
T* <sup>T</sup>	The Research Council for Health, Academy of Finland (1994).
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