United Nations
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ICSU
International Council for Science

CONFERENCE BACKGROUND PAPER

Academies of Sciences in today's world: roles and organization

With special attention to the Academies of Eastern and South Eastern Europe

Prepared for the Conference

Global Science and National Policies: the Role of Academies

4-5 MAY 2007, CHISINAU, REPUBLIC OF MOLDOVA

Contents

I. Introduction

ORIGIN AND PURPOSE

This paper has been prepared at the request of UNESCO (Venice and Moscow Offices) and the International Council for Science (ICSU) to provide input for discussions at the Conference of the Academies of Sciences of Eastern and South Eastern Europe on the theme "Global Science and National Policies: the Role of Academies", to take place in Chisinau, Republic of Moldova, on 4 and 5 May 2007, by the Moldovan Academy of Sciences.

Although commissioned by UNESCO and ICSU, this paper does not reflect any official position or opinion of either organization. Its content is the exclusive responsibility of the author, Prof. dr. Albert W. Koers, formerly Executive Director of the InterAcademy Council (IAC) and presently IAC General Counsel.

In line with the overall theme of the Conference, the paper focuses on the role of Academies of Sciences, both in relation to science and the science community and in relation to society and (governmental) decision-makers. However, its focus is not restricted to the external functions of Academies, but it will also consider some internal organizational aspects: given the external functions of an Academy, what is – generally – required in terms of organization and infrastructure for an Academy to realize these functions effectively and efficiently? Needless to say, within the constraints of this paper these questions can only be addressed in the broadest terms.

In a discussion as just outlined it is impossible to avoid normative and subjective positions. Indeed, such positions are explicitly advanced to stimulate debate and to invite the reader to contradict and to disagree. Accordingly, the intention of this paper is to identify relevant issues and suggest possible approaches. There is no intention to impose any single point of view: it is for each Academy to decide what it wants its functions to be and how to go about its business. The aim of the paper, then, is solely to provide Academies with input for reflection, discussion and, ultimately, decision.

STRUCTURE AND CONTENT

This paper has the following sections:

1. Section II sets the stage by briefly reviewing the changing environment in which science and Academies of Sciences operate. These changes present new challenges to each and every Academy under the sun.

2. Section III then outlines an overall typology of Academies of Sciences worldwide. It will be argued that essentially all Academies – at present about 90 – fall into one of three archetypes.

3. Section IV focuses the discussion of the preceding two sections on the Academies of Eastern and South Eastern Europe: this largely on the basis of the replies received in response to the Questionnaire sent to these Academies in preparation for the Conference.

Annex I reproduces the Questionnaire while Annex II presents the information received in reply to the Questionnaire in the form of a summary table.

II. New challenges

ROLE OF SCIENCE

Much, if not most, of the prosperity of the developed world is derived from science-based advances in health, agriculture, engineering and a host of other areas in the 20th Century. The people of the world, especially in developing countries, expect the same from science in the 21st Century. However, the present century presents fundamentally different challenges to science, scientists and science organizations than the previous one. If they wish to remain effective, Academies of Sciences worldwide too must adapt to these new challenges.

This is especially true for the Academies of Eastern and South Eastern Europe (ESEE). In addition to worldwide developments and trends, they are confronted, each in their own way, with fundamental changes in the societies in which they operate. These changes range from new governmental structures and procedures and fundamentally different economic realities to radically enhanced expectations on the part of the peoples concerned. This paper is not the place – in fact it would be presumptuous – to elaborate on the far-reaching political, legal, economic and social changes in the ESEE countries beyond recognizing explicitly that they impact most significantly on all ESEE Academies.

However significant the impacts of new local realities are, global developments and trends also need to be addressed in any discussion on the future role of the ESEE Academies, especially in a conference that seeks to link global science and national policies: hence, some brief observations on these developments and trends.

BASIC CHANGES

A recent ICSU report* identified five clusters of changes that have taken place in science and international scientific cooperation.

1. Changes in relation to the mobility and global flows of science and scientists as a result of developments such as the globalization of trade and the use of new information and communication technologies, but also as a result of fears over terrorism.
2. Changes in the production of scientific knowledge, largely as the result of the increased involvement of the corporate sector and of closer links between science and policy priorities set by governments or funding agencies.

* See International Council for Science, 2005, *ICSU Strategic Review of Science and Society: Rights and Responsibilities*.

3. Changes in the speed and scale of innovation, producing new risks and uncertainties that may carry adverse physical, social and ethical consequences. Understanding and fairly communicating these risks and uncertainties requires new approaches.
4. Changes in the governance of science and technology as a result of science and technology pervading ever more dimensions of life, so creating new demands for accountability and ethical conduct.
5. Changes in the nature of expertise on the relations between science and society, especially within NGOs and academia. This new expertise, often under-utilized, offers new opportunities for dialogue between science and society.

Of course, there are more. For example, there is an increased need for science to progress more rapidly in view of the ever-greater urgency of the problems that science is expected to address. There also is the fact that for the first time ever there now are developing countries with a real capacity in science. However, the above suffices to make the point that the world of science and international science cooperation has significantly changed in recent years.

MAJOR CHALLENGES

Given the changes just mentioned, what are the most important challenges facing Academies of Sciences in the years to come? The following five issues seem particularly relevant.**

1. Raised expectations

The UN Millennium Development Goals (MDGs) continue to serve as a driving force for building a global partnership to alleviate poverty and hunger. They also illustrate the raised expectations science is facing in the 21st Century. The MDGs explicitly recognize that science has a most important role to play in their attainment. Of the eight MDGs at least five can only be met with the application of (new) scientific knowledge: (a) to eradicate extreme hunger and poverty; (b) to reduce child mortality; (c) to improve maternal health; (d) to combat HIV/AIDS, malaria and other diseases; and (e) to ensure environmental stability. More generally, science-driven economic and social development is increasingly seen as the way forward for developing countries, while the developed world looks to science to deal with issues like climate change and energy sustainability.

2. Public perception

The reliance on science in tackling the worlds' problems as expressed in the MDGs does not negate the fact that at the same time in many countries large parts of the population are quite critical of the impacts of (the application of) science and technology on society and the environment. This may also be one of the reasons why in many countries science fails to attract the younger generation that it used to do in the past. Academies of Sciences can do much to improve negative perceptions of science and of a career in science by making clear that science is essential for tackling the major problems facing the world today, such as: climate change, energy sustainability, clean drinking water, child mortality, infectious diseases, and, more generally, poverty alleviation. To be effective, Academies should lead not just with words, but also by example and action. If, for example, they wish to have a stronger impact on younger generations, they could begin with attracting younger scientists into their membership. And if they wish more women to enter science, they may wish to induct more women into their own restricted membership.

** Again: from a global perspective. It may well be that a specific Academy is challenged in totally different areas and that this challenge overrides all other problems and issues.

3. Inter– and multidisciplinarity

Advising decision-makers and society at large on real-world problems requires the various branches of science to work together. Yet, reality is that too often such cooperation does not come off the ground, especially when the natural and the social sciences are involved. Although some Academies of Sciences include the social sciences, many Academies worldwide are dominated by the natural sciences. Accordingly, many Academies do not have the breadth of disciplines needed to develop advice that integrates input from all relevant perspectives and that truly meets the needs of decision-makers at various levels. Academies must therefore develop new mechanisms to engage disciplines and expertise they do not have in-house. Such mechanisms may range from bringing in members from disciplines so far not represented to developing new forms of cooperation with other Academies.

4. One voice

Each science organization – national or international – has undoubtedly been created for the best of reasons. However, especially at the international and regional level there is a proliferation of science organizations such that to an outsider the world of science organizations may appear as fragmented as science itself. There is a great deal of overlap in terms of ambitions, and mandates and coordination and cooperation is not always easy to achieve. This situation may have negative implications for the willingness of decision-makers to seek advice on scientific science-related issues: not only may it be difficult to identify the most appropriate organization, but there may even arise questions as to impartiality and quality. Accordingly, the impact of science and scientists in the political arena would be greatly enhanced if science and scientists succeed in speaking with a coherent voice. At the national level Academies have a crucial role to play in this respect.

5. Role in society

In principle, Academies of Sciences have great potential to contribute to science and to science-based decision-making by governments and other sectors of society. Academies represent scientific excellence; they are relatively stable organizations with a long-term perspective; and they are, in principle, essentially independent and impartial. Yet, in reality, many science Academies are quite weak in terms of impact on decision-makers; in terms of supporting science and scientists; and in terms of operations and organization. In some cases the political leadership of a country may even be unaware of the existence of an Academy. This situation is not going to improve by itself – on the contrary, in many countries the situation may be even be getting worse. This suggests that many Academies face a major challenge if they wish to have the role of advisor to government and society. An issue that is of particular concern is the increased need for guidance on the ethics of science, not only with decision-makers and the general public, but also with scientists themselves. Academies are uniquely placed to develop and provide such guidance.

III. A typology of Academies

THREE ARCHETYPES

Obviously, each and every Academy of Sciences is unique in terms of history, traditions, mission, activities, organization and so on. Even so, an analysis of the 90-plus Academies of Sciences that presently exist worldwide shows that they also have a great deal in common, especially in relation to their role vis-à-vis science and society and in relation to their internal organization. In fact, it is submitted that in terms of role and organization there are three archetypes, *i.e*. three generic models that describe in abstract terms the role and organization of all the world's Academies of Sciences. In reality, most Academies do not fit within a single archetype, as they have characteristics of more than one. Moreover, since the three archetypes focus on the role of Academies vis-à-vis science and society, they can also be understood as role models.

These archetypes are presented here to provide input for reflection on past experiences and future tasks and organization of a specific Academy or of a group of Academies – such as the Academies of the ESEE countries. Accordingly, the three archetypes should not be used as models that represent an ideal to be achieved: what is ideal for one Academy may be far from ideal for another and no model can take account of the uniqueness of each institution.

ARCHETYPE I: THE LEARNED SOCIETY

In 1603 the Italian Federico Cesi and three friends founded the "Accademia dei Lincei" – literally the "Academy of the Lynxes" with the lynx symbolizing the importance of observational prowess in science. Cesi and his colleagues created the **Accademia** to serve as a place where scientists could meet and freely exchange ideas and experiences. In 1611 Galileo became a member of the Accademia and with him it took on another role: to defend science against its detractors, in this case the Roman Catholic Church opposing Galileo's heliocentric views of the planetary system. The Accademia dei Lincei closed in 1630 when Cesi died at the age of 45 years.

This brief historical excursion is of interest not only because the Accademia dei Lincei represented the first modern Academy of Sciences, but also because it was the precursor of the first archetype to be discussed here: the **Learned Society**.

The Learned Society is essentially an association of scientists for science. Like the Accademia dei Lincei the Learned Society provides a platform where scientists can meet to exchange experiences and ideas on science and research. For this exchange to be productive, the focus of the Learned Society is usually limited to a specific set of disciplines, usually from the natural sciences. If a broader range of disciplines is covered, the Learned Society is commonly divided into sections or

departments so that within each section or department there is, once again, sufficient common ground for productive discussion.

The Learned Society is therefore primarily intended to serve science, scientists and the science community, mostly within a specific country, but occasionally in relation to a region or even a continent. Its most important function is perhaps to act as a honorific society extending recognition to eminent scientist by inducting them into the Academy's membership. In fact, the selection and election of new members may well be the most important administrative procedure of a Learned Society. Another function of this type of Academy is to defend science and scientists against unwarranted attack, although in a Learned Society this is essentially done re-actively and not pro-actively. Lastly, most Learned Societies are engaged in the publication and dissemination of scientific publications; this often takes the form of Academy Proceedings.

The focus of the Learned Society on science and scientists is also reflected in its international relationships. Often, these relationships are quite minimal: this not only reflects the many alternative channels for direct dialogue on scientific issues among scientists, but also the limited financial resources at the disposal of most Learned Societies. And if a Learned Society does engage in international dialogue it is mostly on issues of science and not on issues of policy.

The leadership of a Learned Society is exclusively in the hands of scientists, primarily selected on the basis of their scientific reputation and prestige. This is especially true for the President: the primus inter pares among his/her scientific colleagues. All issues of policy and substance are decided upon within a relatively small group of elected officers. There usually is a very small permanent staff that is solely charged with supporting the Academy's leadership in administrative and logistical affairs and that has no (or very little) role with respect to matters of policy or substance. The income of a Learned Society is usually quite small and consists mostly of membership fees and relatively small contributions from the government and/or private donors.

One of the most significant assets of the Learned Society is its independence. As an association of scientists for scientists it is not beholden to outside interests, while its activities only require limited financial resources, meaning that it does not have to beg for large amounts of external funding before outside donors.

A problem facing many Learned Societies is the average age of its membership or, rather, the fact that the average age continues to increase. This problem is often the result of members being elected for life, while it is at its most acute in Academies that combine life-membership with a fixed ceiling for the total number of members.

ARCHETYPE II: ADVISER TO SOCIETY

The logo of the website of the US National Academies is quite clear on what the Academies are all about: "Adviser to the Nation on Science, Engineering and Medicine". This is not just a motto: on an average day the website publishes two or three new reports, not only on scientific issues, but also on more general issues that confront society and/or the government. When the US National Academy of Sciences – the oldest of the National Academies – was created in 1863, its basic law stipulated that it should "investigate, examine, experiment, and report upon any subject of science or art" whenever called upon to do so by any department of the government. And this, indeed, is what the "US NAS" has been doing ever since.

There is therefore a second archetype: the **Adviser to Society**, with the US NAS being perhaps the clearest example of that archetype.

Like the Learned Society, the Adviser to Society is an association of scientists elected to membership on the basis of scientific merit. Unlike the Learned Society, the Adviser to Society is not an association just for scientists and science: its target audience is broader and encompasses government and society at large. At its core, the Adviser to Society is a Learned Society, but beyond that core it has a larger mission to also serve government and society. The implication is that, in the Adviser to Society, selecting and electing new members is as important as in the Learned Society, and that equally important are the defence of science and scientists against detractors and the publication of scientific papers and documents. However, the advisory tasks of the Adviser to Society mark a fundamental difference, not only in terms of role, but also organization.

Generally, advisory reports fall into two categories: **policy for science** ("What (governmental) policies promote science and its application?") and **science for policy** ("What has science to say about problems facing society?"). On both sets of issues the initiative for a report may come from an Academy itself, though a report may also be requested by an outside party, such as a government agency. This implies that an Advisor to Society has mechanisms and procedures to identify relevant issues, even if these issues are societal in nature, rather than strictly scientific. This calls for perspectives and expertise beyond the strict limits of science. Also, when an outside party – such as a government agency – seeks advice, the Adviser to Society is capable of mobilizing relevant expertise from among its membership, while it also has the personnel and logistical resources to complete the assignment under the conditions specified by the requesting organization.

In order to fulfill its advisory role the Adviser to Society maintains close relationships and interactions with the government, other relevant institutions and society generally. As many, if not all, societal problems have international dimensions, the Adviser to Society is also an active participant in international scientific cooperation.

It follows from these few observations that the internal organization of an Adviser to Society is quite different from that of a Learned Society. Leadership is still in the hands of elected members, but elected officers - and especially the President - are now also selected in the light of their skills as administrators and their ability to communicate effectively with politicians, decision-makers and the public at large. The role of staff is now crucial, not just with respect to administrative and logistical matters, but also in relation to policy issues such as the preparation and implementation of the decisions of the President and other elected officers. Needless to say, the financial resources of the Adviser to Society are significantly larger than those of the Learned Society, especially when its advisory role is structural, rather than ad hoc.

A most important asset of the Adviser to Society is that it can be a most effective advocate for science and scientists with government and society. The Adviser to Society has the perspectives and mechanisms to respond effectively to the needs of government and society and occasionally it may even manage to anticipate those needs.

The most serious risk facing the Adviser to Society is that it may become so deeply involved in its role as adviser that it disconnects from its roots as a Learned Society. *In extremis,* this may even result in an Adviser to Society losing one of its most important asset: its independence.

ARCHETYPE III: MANAGER OF SCIENCE

The 2004 Annual Report of the Chinese Academy of Sciences contains a six-page Directory just listing the names and addresses of all affiliated organizations. The Fact Sheet on the Academy's website states that the Chinese Academy has 108 scientific research institutes, in excess of 200

science and technology enterprises and more than 20 support units, including a university, a graduate school and five documentation and information centres. Altogether, the Academy has a total staff of about 58,000, of whom 39,000 are scientists (figures from 2000) and this solely in the area of the natural sciences since, in addition to the Chinese Academy of Sciences, there also exist a Chinese Academy of Engineering and a Chinese Academy of Social Sciences.

This brings us to the third archetype to be briefly discussed here: the **Manager of Research**, *i.e.* an Academy that operates a number of research institutes, usually on behalf of the government.

Once again, the Learned Society is at the core of the Manager of Research, while it normally also has a role as Adviser to Society. Just as the Adviser to Society is a Learned Society with additional advisory tasks, so the Manager of Research is an Adviser to Society plus additional tasks in respect of the management of research institutes. To repeat some of the language used before: if the Learned Society is an association of scientists for science and the Adviser to Society an association of scientists for science, government and society, then the Manager of Research is an association of scientists for science, government, society and the conduct of actual research.

Clearly, the Manager of Research needs to be a totally different organization from the Adviser to Society and the Learned Society. In principle, the latter two organizations can be relatively small in size, but the Manager of Research is, of necessity, rather sizable. However, this does not mean that all Managers of Research employ thousands of scientists like the Chinese Academy; a Manager of Research may also operate a relatively small number of research institutes with a limited number of staff.

An essential feature of the Manager of Research is the need to decentralize. As the central body, the Academy may be most influential in setting overall research priorities and in dividing the overall budget, but the actual research is done at the level of the individual institute. This implies that a Manager of Research is always facing the challenge of striking the right balance between central control and local freedom.

Leadership of a Manager of Research is inherently much more complex than of the other archetypes. Leadership at the top of the central Academy is in the hands of elected members (although their terms in office may be quite long), but the complexity of managing a range of different - and often competing - research institutes is such that just below the top it may be necessary to rely on professional, non-elected managers. Accordingly, there not only is a large number of staff, but staffmembers also have important decision-making powers, especially in relation to routine issues. In fact, most of the day-to-day business of a Manager of Research may be carried out by staff, while elected officers focus on strategy and crucial policy issues.

An important asset of the Manager of Research is its ability to give focus and drive to the research efforts of a country, especially in areas prioritized by the government. For that reason, the Manager of Research is seen in many countries as an important institution in the process of national development.

One of the risks facing the Manager of Research is its dependence upon government funding. Creating and operating top-level research institutes may require not only quite a lot of money, but also a long-term commitment and investment - and government funding is too often subject to short-term political uncertainties. This implies that the Manager of Research may find itself caught in a tough spot: no longer receiving adequate funding from the government and unable to adapt to new realities without destroying what has been built up over so many years.

IV. ESEE Academies

QUESTIONNAIRE

Of all ESEE Academies, about half responded to the Questionnaire (see Annex I) that was sent out in preparation for the Conference. For this reason, the responses received should not be considered representative of all ESEE Academies. Even so, it is possible to make a number of generalizations. For a summary of the information collected through the Questionnaire, see Annex II.

Differences in size

There is a tremendous difference in size among the (responding) ESEE Academies, ranging from the National Academy of Sciences of Ukraine with 543 members, a total staff of over 39,000 and an average budget of US$ 289 million to the Academies of Bosnia & Herzegovina, Kosovo, former Yugoslav Republic of Macedonia and the Srpska Republic (Bosnia and Herzegovina), all with less than 50 members, very few staff members and budgets ranging from US$ 200,000 to US$ 1 million. Of course, the political and economic realities behind these differences need no explanation here, but the fact is that in the ESEE region there are more extreme variations in size of Academies than in Western Europe (where they are mostly medium-sized), Africa (with the exception of South Africa (mostly small), South America (mostly medium to small) and North America (large). Asia is perhaps the only other region that shows a similar variation in size. Extreme variations in size may hinder cooperation as there is less common ground and experience to share.

Range of disciplines

Worldwide, most Academies of Sciences have a strong focus on the natural sciences – as indeed had the Accademia dei Lincei, the precursor of all Academies. The ESEE Academies are a marked exception to this general picture. Membership of all (responding) Academies is drawn not only from the natural sciences, but also the social sciences, the humanities, the medical sciences and the technical sciences. The proportions vary from Academy to Academy, but overall these Academies have an above-average mix of disciplines represented in their membership. This undoubtedly helps them in their role as Adviser to Society or Manager of Research.

Manager of Research

Even with this extreme variation in size, there is a great deal of commonality among the ESEE Academies. In the terms of the archetypes discussed in the previous section, most fall in the category of "Manager of Research", which is not surprising since this model was widely adopted by communist governments, precisely in view of its ability to promote scientific progress in areas prioritized by the State. The number of research institutes managed by an Academy varies significantly, from 182 for the National Academy of Sciences of Ukraine to 2 for the Academy Sciences and Arts of Bosnia & Herzegovina. The same variation is found in the number of scientific staff employed: about 16,350 for the Ukrainian Academy to 2 in the Academy of Sciences and Arts of Bosnia & Herzegovina. Of all Academies that responded, only the Academies of Kosovo and Turkey do not manage any research institutes at all.

Adviser to Society

All (responding) Academies indicate that they act as Adviser to Society, especially in relation to the government. The number of advisory reports varies again significantly, from about 200 in a five-year period for the Moldovan Academy of Sciences to four for the same period for the Kosovan and Macedonian Academies. However, a possible explanation for this variation may be that the term "advisory report" easily lends itself to different interpretations.

Learned Society

All ESEE Academies are active in their role as Learned Societies. They organize scientific meetings on a regular basis and they are all involved in the publication of scientific papers. Again, the number of meetings varies, as does the number of publications, but all recognize that an Academy is not really an Academy if it disregards its roots as a Learned Society.

International relations

A more fragmented picture emerges in the area of international relationships. A few Academies are member neither of ICSU, nor of the InterAcademy Panel on International Issues (IAP); some are members of either ICSU or IAP; and a small majority (of the responding Academies) are members of both. However, regardless of their membership status, most (responding) Academies participate only in a very small number of ICSU or IAP meetings. Financial constraints are undoubtedly one of the major reasons for this state of affairs. The picture is more positive in relation to bilateral inter-Academy cooperation and participation in international research projects, but in most cases the focus of these activities is on Academies in the region or on regional projects.

Membership

Almost all Academies participating in the Questionnaire have in common that their membership is of an advanced age. Most Academies have no members under the age of 50, while in many Academies the average age is over 70 years of age. As was mentioned before, this situation is not unique to the ESEE Academies, since many Academies worldwide find themselves in similar circumstances. However, even in the absence of complete and reliable figures, its seems likely that, worldwide, the ESEE Academies find themselves at the extreme of the age-spectrum. Another membership issue facing Academies of Sciences worldwide is the under-representation of women, especially at higher decision-making levels. Although the Questionnaire did not produce hard data, it appears likely the ESEE Academies are also in this situation.

This is not the place to speculate in any detail on the background of the above characteristics: the Academies concerned are in a much better position to identify the reasons than any outsider or outside organization. As indicated earlier, for a third party it would even be presumptuous to engage in such speculation, and the same holds true for suggestions as to possible solutions.

ORGANIZING CHANGE

Section II of this paper stressed that the world of science is no longer what it used to be and that globally there are significant developments and trends. That section also outlined some of the resulting challenges that Academies of Sciences are facing today. In addition, the ESEE Academies are confronted with radical changes to the immediate political, economic and social environments in which they operate. All this implies that the President and other elected officers of an ESEE Academy find themselves in a most complex and fluid situation. The science they know may not be the science that is needed today, while the institutions they are used to may no longer be the institutions that science or society presently requires.

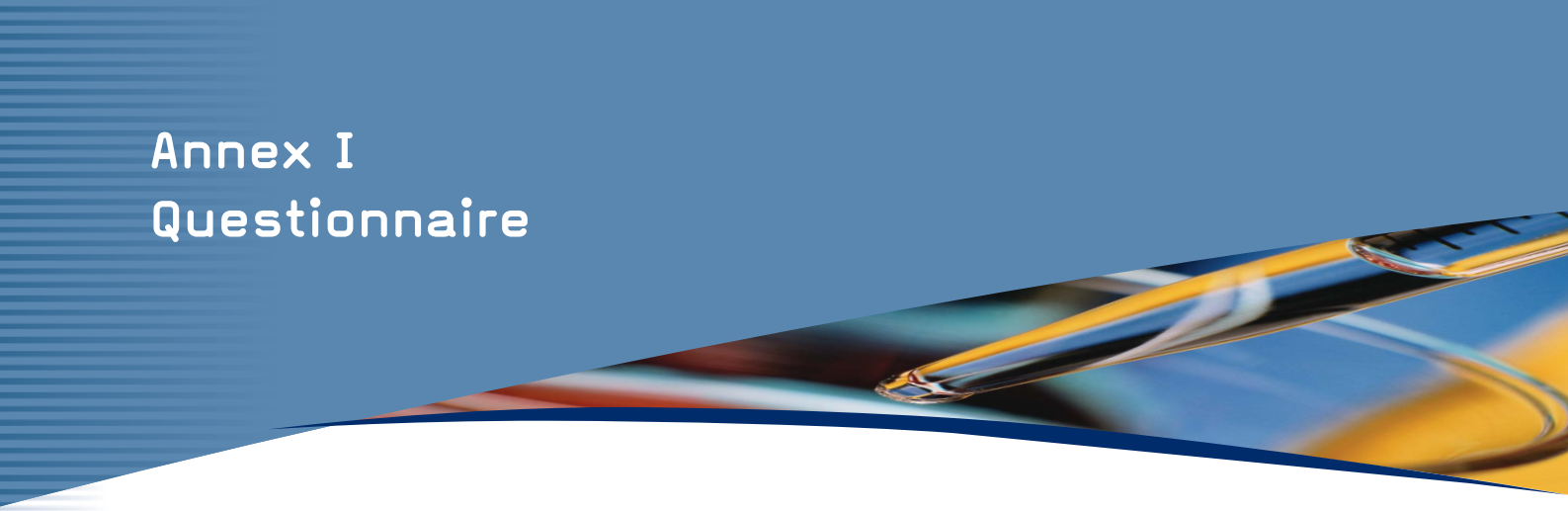
It is therefore not surprising that many Academies of the ESEE region are facing major challenges. Being a Manager of Research may be a most important role to perform, but it quickly loses much of its value if available budgets drop below what is minimally required. And the role of Adviser to Society also needs a minimum of resources, financial and otherwise, if an Academy wishes to be taken seriously in that role. At a reduced level this is even true for the Learned Society. Many ESEE Academies have responded to these developments by initiating a process of change, both in relation to their role or roles vis-à-vis science, scientists and society and in relation to their internal organization.

One possible concrete expression of such a process of change would be the elaboration and drafting of new statutes, provided this is not approached as a hollow exercise in legal pen- and craftmanship. Rather, the drafting of new statutes should be seen as a vehicle to systematically examine, discuss and, when necessary, re-invent an Academy. If approached in this manner, new statutes would capture in words the outcomes of an Academy-wide process of renovation and rejuvenation to make the Academy ready to face the challenges of the 21st Century.

Of all the issues and provisions to be examined in elaborating new statutes the single most important set deals with the selection and election of members. If there is one message pervading the previous sections it is this: whatever role or roles an Academy of Sciences has, it is the Learned Society that is essential: without a Learned Society of the highest calibre, there can be no credible and effective role as Adviser to Society or as Manager of Research.

And the quality of a Learned Society is directly proportional to the quality of its membership, both individually and collectively. This, then, may suggest the most crucial issue facing the ESEE Academies today.

Annex I
Questionnaire



I. MEMBERSHIP

Disciplines represented in the Academy

1. Total number of members of the Academy?
2. How many from the natural sciences?
3. How many from the social sciences (including economics)?
4. How many from the humanities?
5. How many from health and medical sciences?
6. How many from engineering and technical sciences?

Age composition of membership

7. How many members are under age 70?
8. How many members are under age 60?
9. How many members are under age 50?

II. ACTIVITIES

Management of research institutions

10. Is the Academy charged with managing active research institutions?
11. If so, for how many institutions is it responsible?
12. If so, what is the total number of active researchers employed at these institutions?
13. If so, what is the total number of staff (research + support) at these institutions?
14. If so, what is the total budget available for these institutions?
15. What percentage of this budget comes from the government?

Please list in a separate annex the areas of research covered by these institutions.

Scientific and organizational activities

16. What is, on average, the number of meetings per year of Academy members?
17. Of these meetings, how many are devoted to managing the affairs of the Academy?
18. Of these meetings, how many are devoted to a scientific topic?
19. On average, how many members participate in these meetings?
20. Does the Academy publish any periodicals or reports?
21. If so, how many publications were issued in the last five years?
22. Is the Government seeking advice from the Academy?
23. If so, how many advisory reports were issued in the last five years?

Please list in a separate annex the titles of the most recent advisory reports.

International relationships

24. Is the Academy a member of ICSU and/or IAP?
25. To which ICSU International Scientific Unions does your Academy adhere?
26. To which ICSU Interdisciplinary Bodies does your Academy adhere?
27. Does the Academy participate in ICSU and/or IAP meetings?
28. If so, how many meetings of ICSU were attended in the last five years?
29. If so, how many meetings of IAP were attended in the last five years?
30. Does the Academy maintain structural relationships with other Academies?
31. Does the Academy participate in international research projects?

Please list in a separate annex the other Academies with which the Academy cooperates.
Please also list the most important international activities in which the Academy participates.

III. ORGANIZATION

Officers and staff

32. How many elected officers does the Academy have?
33. Are all officers elected from among the Academy's members?
34. What is the maximum term in office of the President of the Academy?
35. Does the Academy have any permanent staff paid by the Academy?
36. If so, how many full time staff positions are available?

Facilities and budget

37. Does the Academy have a permanent office of its own?
38. What is, on average, the annual budget for staff and office expenses?
39. What is, on average, the annual budget for programmes and other activities?
40. What is, on average, the annual budget for international cooperation?

Please list in a separate annex the principal organs and officers of the Academy.

ANNEXES

Annex 1: Areas of research covered by research institutions managed by the Academy
Annex 2: Titles of the most recent advisory reports
Annex 3: Academies with which the Academy cooperates
Annex 4: International research projects in which the Academy participates
Annex 5: Principal organs and officers of the Academy

Annex II
Summary table of the replies to questionnaire

I. MEMBERSHIP	Armenia	Bosnia & Herzegov. (Federation of)	UNMIK (Kosovo Academy)	FYR of Macedonia	Moldova	Romania	Srpska Republic (Bosnia and Herzegovina)	Turkey	Ukraine
Disciplines represented in the Academy									
1. Total number of members?	97	49	26*	38**	106	161	35	119	543
2. From the natural sciences?	31	7	5	5	38	60	7	67	300
3. From the social sciences?	5	2	6	6	8	22	8	24	62
4. From the humanities	10	13	11	18	17	38	13	0	25
5. From the medical sciences?	7	9	2	4	14	12	4	28	29
6. From the technical sciences?	44	9	2	5	29	29	3	0	127
Age composition of membership									
7. Members under age 70?	29	17	14	8	40	54	10	86	197
8. Members under age 60?	4	1	4	3	9	8	3	54	94
9. Members under age 50	0	0	0	0	1	0	0	16	11
II. ACTIVITIES									
Management of research institutions									
10. Charged with managing research insitututions?	Yes	Yes	No	Yes	Yes	Yes	Yes	No	Yes
11. How many institutions?	37	2		5	39	62	5		182
12. Number researchers at these institutions?	2115	4		13	952	2475	24		16349
13. Total number of staff at these institutions?	3724	8		17	2665	3979	48		39190
14. Total budget for these institutions?		Euro 25 K		Euro 16,5 K	US$ 17,8 M	Euro 34 M	Euro 100 K		US$ 292 M
15. Percentage of budget from government?	70	60		90	90	83	20		81
Scientific and organizational activities									
16. Number meetings members per year?	18	40	50	4	2	60	52	150	4
17. How many on affairs Academy?	18	25	40	2	1	12	12	50	1
18. How many on scientific topic?	45	15	10	2	1	30	24	100	3
19. Average number of participants?		10	20	30	100	80	10	2-80	490
20. Publication of periodicals or reports?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
21. How many publications in last 5 years?	11000	47	65	145	5750	400	18	90	575
22. Does government seek advice from Academy?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
23. Number advisory reports in last 5 years?		6	4	4	200	4	10	15	

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International relationships									
24. Member of ICSU and/or IAP?	Yes/Yes	No/Yes	No/No	Yes/Yes	Yes/Yes	Yes/Yes	No/No	No***/Yes	Yes/Yes
25. How many ICSU Scientific Unions?	5			1		28			10
26. How many ICSU Interdisciplinary Bodies?						3			3
27. Participation in ICSU and/or IAP meetings?	Yes/Yes	No/No	No/No	No/No	Yes/No	Yes/No	No/No	No/Yes	Yes/No
28. How many ICSU meetings in last five years?	1				1	2			5
29. How many IAP meetings in last five years?	1							10	
30. Structural relations with other Academies?	Yes (10)	Yes (7)	Yes (6)	Yes (25)	Yes (12)	Yes (43)	Yes (7)	Yes (16)	Yes (32)
31. Participation in international research projects?	Yes (16)	Yes (1)	Yes (1)	Yes (16)	Yes (5)	Yes	Yes	Yes	Yes
III. ORGANIZATION									
Officers and staff									
32. How many elected officers?	7	4	7	9	5	23	9	11	31
33. All officers from among members?	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes
34. Maximum term of the President?	10 years	No limit	6	4	4	4	6	8	5
Gender balance in decision-making?****	♂♂♂♂	♂♂♂♀						♂♂♂♀	♂♂♂♂
35. Permanent staff paid by the Academy?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
36. How many full time positions?		25	11	35	70	126	9	12	273
Facilities and budget									
37. Permanent office facilities of its own?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
38. Average annual budget staff and office?	US$ 720 K	Euro 380 K	Euro 120 K	Euro 437 K	US$ 97.3 K	Euro 6.45 M	Euro 325K	US$ 975 K	US$ 3.3 M
39. Average annual budget programmes/activities?	US$ 700 K	Euro 200 K	Euro 165 K	Euro 300 K	US$ 1.2 M		Euro 75 K	US$ 1.5 M	US$ 289 M
40. Average annual budget internat. cooperation?	US$ 1.8 M	Euro 12.5 K	Euro 20 K	Euro 40 K	US$ 460 K	Euro 106 K	Euro 10 K	US$ 49 K	US$ 500 K

* Plus 15 foreign members

** Plus 1 honorary member and 28 foreign members

*** Turkish Academy of Sciences is not the national Turkish member of ICSU

**** In error, this question was not included in the questionnaires sent to these Academies

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