

The Académie des sciences of the Institut de France

Dominique Meyer, Guy Laval and Anne Bernard¹

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The Académie des sciences is one of the five Academies which constitute the *Institut de France*, with the *Académie française*, the *Académie des Inscriptions et Belles-Lettres*, the *Académie des Beaux-Arts* and the *Académie des sciences morales et politiques*. The *Institut de France* is located 23 quai de Conti, 75006 Paris.

Historical Aspects

The Académie des sciences owes its origin to the plan of Colbert, Prime Minister under Louis XIV, to create a general academy, with the aim of "perfecting research in geometry, astronomy, mechanics, anatomy, chemistry and botany". It also issues from the lineage of diverse groups of scholars who gathered, in the 17th Century, around a learned personality. In 1666, Colbert chose a small group of scholars who met in the library of Louis XIV, then newly located rue Vivienne in Paris. The first 30 years of the Académie's existence were relatively informal, since no statutes had as yet been laid down for the institution. On January 20, 1699, Louis XIV gave the Company its first rules. The Académie received the title of Académie royale des sciences and was installed in the Louvre in Paris. Comprising 70 members, the Académie contributed to the scientific movement of its time through its publications and it played a role as counsellor to those in power.

In 1793, the Convention abolished all the Academies. Two years later, a National Institute of Sciences and Arts was put in place, bringing together the old Academies of the sciences, literature and arts. In 1805, the National Institute of Sciences and Arts was transferred to its present location. In 1816, the Académie des sciences became autonomous, while forming part of the *Institut de France*; the head of State remained its patron. The *Comptes rendus* (Proceedings) were created in 1835, under the influence of François Arago, Member of the Académie, and became an instrument of importance for the diffusion of French and foreign scientific works.

In the past five years, the Académie adapted its structures and its missions in order to face the accelerated development of scientific research in France and to remain faithful to its vocation. It initiated a far-reaching reform of its statutes, concerning its membership as well as its missions (decree of 2002 and 2003).

Mission of the Académie

The Académie des sciences is independent.

- It recruits French and foreign scientists who are selected from among the most eminent and contribute by their involvement to the accomplishing of the missions of the Academy.
- It encourages scientific life and contributes to progress in the sciences and in their applications.
- It studies societal questions associated with the development of the sciences and formulates recommendations, sometimes with the involvement of other Academies.
- It develops international scientific relations, notably within the European Union, and the representation abroad of research carried out in France.

¹ Dominique Meyer is a Member of the Académie des sciences and Head of the Department of scientific information and communication; Guy Laval is a Member of the Académie des sciences and Foreign Secretary; Anne Bernard is chief of the Department of scientific information and communication.

- It monitors the quality of the teaching of the sciences.
- It encourages the diffusion of science among the public and ensures that the products of scientific development are integrated into the culture of people of our time.
- It upholds the role and the quality of French as scientific language.

The Académie des sciences reflects upon the place occupied on the world stage by research undertaken in France, upon the organization of the research, upon the directions of the scientific programmes, and also upon technology and the applications of the sciences.

http://www.academie-sciences.fr/presentation/statuts_missions_gb.htm

Organisation of the Académie

Owing to the 2002-2003 reform of its statutes, the number of Members has increased to nearly 250, aged under 75. Since 2002, 50% of elected Members have to be under 55. There is no longer an election of Corresponding members. The status and the number of Foreign Associates remain unchanged.

All members are grouped into two divisions. The first division comprises the following sections: Mathematics; Physics; Mechanics and Informatics; Sciences of the Universe; the second division comprises: Chemistry; Cellular and Molecular Biology, Genomics; Integrative Biology; Human Biology and Medical Sciences. An intersection "Scientific applications" brings together those Academicians from these two Divisions who are directly concerned with applications.

The executive Board (*Bureau*) of the Académie is composed of the President, the Vice-President (both elected for two years, each representing one of the two divisions) and the two Permanent Secretaries, one for each Division, elected up to their 75th birthday.

There are three Departments (*Délégations*) working in close contact with the Board: a Department of Foreign Affairs (*Délégations aux relations internationales*, DRI), a Department for Scientific Teaching (*Délégation pour l'enseignement et la formation*, DEF) and a Department for Scientific Information and Communication (*Délégation à l'information scientifique et à la communication*, DISC). The administration of the Academy is structured in the form of services placed under the authority of the two Permanent Secretaries.

An advisory Council (*Comité restreint*) comprises the four members of the Board, ten Members of the Academy, elected by their peers, and the elected chairpersons (*délégués*) of the nine sections and intersection. This Council is consulted by the Board, about once a month, on any point involving academic affairs. The General Assembly (*Comité secret*), which comprises all the Members, addresses questions deemed important by the Board, the *Comité restreint* or by petition from 20% of the Members. Conclusions of debates are subject to formal votes. The Administrative Commission deals with questions relating to budget, personnel and the management of the Academy's properties, funds and donations; it comprises the Members of the Board and two elected Members (one per Division).

Activities of the Académie

Promotion of scientific knowledge

The Académie carries out this activity, on its own or with other Academies:

- by undertaking studies, on its own initiative or at the request of public powers, and by helping to define scientific and technical research policy. These studies mostly result in publication of detailed reports: http://www.academie-sciences.fr/publications/rapports/liste_rapports_RST_gb.htm
- by presenting recommendations, wishes or suggestions concerning problems of national or international interest: http://www.academie-sciences.fr/publications/avis_gb.htm.

- by designating its Members to represent the Académie, when invited, on various bodies, councils or committees or by giving its opinion on nominations in response to statutory demands.

By virtue of its multidisciplinary approach, the Académie plays a role in scientific life and provides its support for the latter. In particular:

- It publishes rapidly brief and review articles, in French or in English with a summary in the other language in its *Comptes rendus* (Proceedings). They comprise seven series: Mathematics, Mechanics, Physics, Geosciences, Paleontology-Evolution, Chemistry and Biologies (see: http://www.academie-sciences.fr/publications/comptes_rendus_gb.htm).
- *La Lettre de l'Académie* is a thematic quarterly journal which comprises reviews written mostly by Academicians: http://www.academie-sciences.fr/publications/lettre_gb.htm.

The Académie organises several types of meetings, sometimes in collaboration with other Academies of the *Institut de France*, as well as other national or foreign Academies (Academy of medicine, Academy of technologies, Academy of agriculture). There are also exchanges of lecturers with foreign Academies. In its public meetings on Tuesday, it presents original works or overview studies:

Three to six times a year, it organizes international colloquia, on topical themes, often in cooperation with other Academies: <http://www.academie-sciences.fr/conferences/colloques.htm>. Most colloquia are published in the form of a report on thematic issues of the *Comptes rendus*.

Life of the Académie

Election of new members

Almost every year, there is an election of new Members. The list of the new Members has to be signed by the President of the Republic. Election of new Foreign Associates takes place every 3 years.

Awards

Awarding French or foreign researchers is an important annual mission of the Academy since the XVIIIth century. About 25 major Prizes and 55 thematic Prizes are awarded each year. The most prestigious international Prize is the Grande Médaille, which is attributed annually, alternatively by the first or the second Division: http://www.academie-sciences.fr/prix/generalites_gb.htm.

Teaching the sciences

The Academy supports the *La Main à la pâte* ("Hands on") programme, initiated in 1996 by Physics Nobel Prize winner Georges Charpak, aimed at revitalizing the teaching of the sciences in the primary schools in France. The general idea is to lead children to participate in the discovery of natural objects and phenomena, to bring them into contact with the latter in their reality directly through observation and experimentation. This activity now involves a very large number of international extensions, including the creation of a multilingual website for teachers all over the world.

Defence of scientists

who are victims of human rights violation. In this regard, a standing committee (CODHOS) has been created, together with the other Academies of the *Institut de France* and foreign Academies.

Conservation of the records of science and scientists (archives)

Through its archives service, the Academy provides the conservation of documents which contribute to the knowledge of the history of sciences and of the progress of scientific thought. It retains sealed documents (*plis cachetés*) which have been deposited there since the XVIIIth Century and can be used to establish the anteriority of a discovery (see:

Funds

The Academy receives funds and legacies which enable it to distribute prizes and awards and which contribute to the financing of an important part of its activities. Two of these are museums open to the public: the Pasteur house in Arbois (Jura) and the castle of Antoine d'Abbadie in Hendaye (Pyrénées Atlantiques).

International activities

As any scientific organization, the Académie des sciences runs various international activities stretching from the election of Foreign Associate Members to individual relations of Members with foreign colleagues. Among them, the Foreign Secretary has to implement those which involve the Académie as a whole or imply a commitment of the Board. They mainly concern:

- bilateral or multilateral partnership with foreign academies
- interaction with international scientific organizations
- exchange programs for Members or French scientists
- international prizes
- issues linked to scientific international policies.

Partnership with foreign academies

The Académie des sciences has made formal agreements with many National Academies of Sciences. Their purpose is to stimulate contacts between Members of foreign academies and Members of the French Académie des sciences.

These partnerships include mutual visits of high-ranking delegations. They allow comparing the policies regarding, for instance, the impact of the work of academies work on the general public and on politicians, the methods used for promoting scientific education and attracting students to the scientific professions, the rules and regulations of academy management etc.

These relations lead, most of time, to exchanges of reports and documents which contain useful information in these fields. They are also an opportunity to provide advices and helps to newly founded academies. The cooperation may include meetings and workshops where specific common scientific issues are debated.

Links of the Académie des sciences with developing countries have been recently strengthened by the creation of the InterAcademic Group for Development (GID). This group is mainly intended to coordinate the activities concerning countries of the Mediterranean basin. About 20 foreign academies and scientific organisms are integrated in this network. More generally, discussions on development take place periodically in mini forums, following initiatives of an ad hoc committee (COPED) with a particular emphasis on health, nutrition and environment.

Interaction with international scientific organizations

The Académie des sciences belongs to many international scientific organizations. Their expected efficiency is mainly based on the weight of their recommendations which is increased by the endorsement of the whole scientific community or at least of regional academies. Moreover, they further solidarity between the member countries and naturally lead to a mutual support.

Among them, the French Académie des sciences belongs to the InterAcademy Panel (IAP), a global network of the world's science academies, issuing statements on critical global matters. The InterAcademy Panel has very efficiently helped the Académie des sciences and its Department for Education to introduce a new method for teaching science in more than 30 countries. This project,

called "*La main à la pâte*", aims at promoting a concrete method for teaching science to young children. In Europe, the "POLLEN" project is testing the method in 12 European countries with 30.000 pupils.

The Académie des sciences is also a member of the InterAcademyCouncil (IAC), which is more focused on producing reports, of the European Academies Science Advisory Council (EASAC), gathering together the EU scientific academies, and of ALLEA.

The Académie des sciences is a full National Scientific Member of the International Council for Science (ICSU) where it stands officially for France. Consequently, the Académie des sciences has set up a French Committee for International Scientific Union (COFUSI) to conduct hearings of the National Scientific Committees and to implement the missions entailed by its position in ICSU.

Exchange programs

Most of the bi-lateral agreements between the Académie des sciences and a foreign academy contain exchange programs that allow foreign scientists to stay in France for a few weeks to visit laboratories or to do research and *vice versa* for French scientists. Other agreements imply that alternately each contracting academy sends a member to give a lecture in the other academy. Such lectures are often patronized and then bear a name. This is for instance the case for the Humphry Davy lecture with the Royal Society and the Wolf Ramanujan Lecture with the Indian Academy of Sciences.

Scientific exchanges with foreign academies are also efficiently driven by recurrent workshops or seminars involving distinguished scientists of the two countries.

Other programs aim at increasing the mobility of researchers by helping them to find laboratories and funding. For instance, the French-Chinese Foundation for Science and Applications (FFCSA) gives Chinese post-docs the opportunity to spend several years in France. Similar other extensive programs should be developed in the near future for other countries.

International prizes

International prizes are considered as another approach to cooperation between the Académie des sciences and other academies. Members of the jury have to work together and confront their views on science. Moreover the prizewinners give lectures on their own research. The Royal Netherlands Academy of Arts and Sciences (KNAW), the Académie des sciences and the French Académie des sciences morales et politiques (ASMP) reward a remarkable scientific collaboration between France and Netherlands. The jury of the Microsoft Prize for Science in Europe brings together an equal number of Royal Society Members and of Académie des sciences Members. The Richard Lounsbery Prize is given jointly by the US National Academy of Sciences and the Académie des sciences and covers travel expenses resulting from visits between French and US laboratories.

Scientific international policies

The Académie des sciences has close contacts with UNESCO particularly by taking part in giving the L'Oreal-UNESCO- Académie des sciences scholarships for women in science. The Académie des sciences contributes to the Joint Science Academies' Statements that are prepared for the G8 or G8+5 summits. These last few years, the preparation of these recommendations entailed a large amount of work to reach an agreement on the issues raised by the energy crisis, climate change and society adaptation. It may be considered as the most important activity on global policy.

On a smaller scale, the Académie des sciences is looking for a partnership with European governing bodies. With the help of EASAC and of the European Commission, a pairing of European Parliament Members with European scientists has been designed to improve the understanding between European politicians and researchers.