

Supplemental Material

IN DEFENSE OF THE USE OF THE FRENCH LANGUAGE IN SCIENTIFIC COMMUNICATION, 1965 – 1985. NATIONAL AND INTERNATIONAL DELIBERATIONS AND AN INGENUOUSLY CLEVER TAKEOFF ON THE THEME BY R. B. WOODWARD

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Pages 2 – 19

An English translation of the “Rapport de l'Académie des Sciences sur la langue française et le rayonnement de la science française” (“Report by the Academy of Sciences on the French Language and the Influence of French Science”) (1). Published with the kind permission of the French Académie des Sciences.

Pages 20 – 24

An English translation of Jean-Marie Lehn’s paper “Langue de la science et science des langues : Multilinguisme ou langue unique ? Le point de vue d’un utilisateur” (“The Language of Science and Science of Languages: Multilingualism or Single Language? The Point of View of a User”) (2). Published with the kind permission of the journal *Traduire*.

References

1. Anonymous (Comité secret), “Rapport De L'académie Des Sciences Sur La Langue Française Et Le Rayonnement De La Science Française”, *C. R. Acad. Sci. Paris*, **1982**, 295, 131-146.
2. J.-M. Lehn, “Langue de la science et science des langues : Multilinguisme ou langue unique ? Le point de vue d’un utilisateur”, *Traduire*, **1983**, 63-65.

COMITÉ SECRET

M. Li Yanxian sera présenté à M. le **Ministre de l'Éducation nationale** pour l'emploi de Professeur de Biogéographie au *Muséum national d'Histoire naturelle*.

**Rapport de l'Académie des Sciences sur
la langue française
et le rayonnement
de la science française (1)**

***Comptes Rendus Acad. Sci. Paris, 295:131-146, 1982. (Session
of November 8, 1982)***

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SECRET COMMITTEE

REPORT BY THE ACADEMY OF SCIENCES ON THE FRENCH LANGUAGE AND THE INFLUENCE OF FRENCH
SCIENCE) (1)

OUTLINE

INTRODUCTION

1. THE PROBLEM

- (a) NEED FOR SCIENTIFIC COMMUNICATION
- (b) ENGLISH, THE LANGUAGE IN COMMON AMONG SCIENTISTS
- (c) THE FUTURE OF FRENCH IS THREATENED

(1) Report adopted in secret committee on April 19, 1982

2. THE MAIN OPTIONS

- (a) INTRANSIGENCE**
- (b) RESIGNATION**
- (c) THE REALISTIC OPTION**

3. PROPOSALS

TWO PRELIMINARY REMARKS

(a) USING ALL THE ASSETS OF FRENCH SCIENCE IN SUPPORT OF THE INFLUENCE OF FRENCH CULTURE AND LANGUAGE

— **Hosting foreign scientists:**

**students,
professors and researchers**

— **Organizing high-level international events in France:**

**summer schools [courses]
conferences and colloquia**

— **France's place in the international institutions**

— **Stays of French professors and researchers abroad)**

— **Development and strengthening of scientific services in our embassies**

(b) DEVELOPING EXPRESSIONS OF FRENCH SCIENCE AND TECHNOLOGY IN THE SERVICE OF SCIENTIFIC EDUCATION/TRAINING AND INFORMATION IN THE FRENCH-SPEAKING COUNTRIES:

— **Works and journals of education**

— **Specialized technical journals and works**

— **Popularization activities**

— **National scientific events**

— **Audio-visual documents**

— **Enhancing the value of these scientific resources by translation**

(c) ASSURING THE FRENCH PRESENCE IN HIGHLY SPECIALIZED SCIENTIFIC MEETINGS AND PUBLICATIONS

- **Official texts and records**
- **Specialized international scientific meetings**
- **Specialized monographs**
- **Specialized scientific journals**
- **Technical publications**

CONCLUSION

INTRODUCTION

The French language, which was once the universal mode of cultural expression par excellence, has little by little lost this privilege. Worse, when one imagines the likely progression of recent developments – in view of the predictable consequences of the current political, economic, and technological situation – there is a fear that the future of the French language may be seriously compromised within a few decades, in places where today it is still the national language.

Awareness of this dangerous situation is by no means a recent development. The current French government does, it seems, clearly discern the dimensions of the danger and the need for vigorous action in order to avoid it. Now, one of the most visible signs of the situation referred to above is demonstrated by the practices of the French scientific community. It is not surprising therefore that the first actions the government is contemplating concerns this community (1).

The Academy of Sciences has long known that the use of the French language in scientific communication is a difficult problem about which its members and corresponding members hold various opinions, which sometimes diverge, due to the contradictory demands of the problem. But, given the national importance of what is at stake and the imminence of the decisions in preparation, the Academy decided to engage in a reflection on the matter and to publicize the conclusions reached.

This communication contains three parts devoted in succession to the analysis of the problem, the statement of the *main options*, and the formulation of *proposals*.

1. THE PROBLEM

In the first place, one must understand the contradictions that become evident when the following are brought together:

- The need for scientific communication
- A fact: the use of English as the language in common of science
- An imperative: the defense of the threatened French language

(a) THE NEED FOR SCIENTIFIC COMMUNICATION

There is no science without communication: what is not communicable and is not communicated to others is not science. To do science, each of us must know what the others are engaged in, at home and elsewhere, especially elsewhere, not because it is better, but because it is larger, ten to twenty times larger without a doubt. We must therefore understand what others abroad communicate to us, what they say and write.

Our results must also be communicated abroad, and it must be clearly understood why this is an equally pressing need. Is it to pay our debt to other countries? Yes, no doubt. To promote French influence abroad? Yes, undoubtedly! But the real need for this derives from something else.

(1) For example, the statement by Mr. Jean-Pierre Chevènement, Minister of State, Minister for Research and Technology, dated September 22, 1981. This was not the only instance demonstrating the intentions of the government in recent months.

Our science needs to be examined, critiqued, and tested abroad; it must be compared to findings obtained elsewhere that are sometimes contradictory, sometimes complementary. Without such regular comparison, confrontation, such testing, and without the international collaborations resulting from them, our science would become isolated and narrow and would at times lose its way, and, in the end, would decline, sooner or later. National independence, which we cherish, is neither possible nor desirable in the domain of pure science.

Whatever may be the many and varied individual motivations that push scientists to publish, if they cannot desist from publishing abroad, it is neither because of altruism nor for the sake of serving the prestige of France – however noble these two causes may be – but because the vitality of French science has this price. A national science that does not participate in the science of the world is condemned to a short life.

(b) ENGLISH, THE LANGUAGE IN COMMON AMONG SCIENTISTS

In every age, scientists have used one preferred language for communication. During several centuries it was Latin or French. For forty years now, English has been the main language of science, English as spoken and written not only by its native speakers, the British or the Americans, but also, with variable success, by those from the developed countries, the Japanese and Scandinavians, Germans and Dutch, the French, Italians and Spanish, Belgians and Israelis, and people from the Soviet Union and Eastern Europe. A vast majority of national publications (1), scientific journals and specialized monographs, are increasingly adopting English or are at least giving it a great deal of space. English is also the scientific language of the large developing countries, India, Pakistan, in Latin America, and many Arab countries

Even though French is still the working language of scientists in western Africa, in the countries of the Maghreb [Morocco, Algeria, etc], in Quebec, and in certain European francophone countries, English is by now the international language of science; it could very soon become the only language.

Conscious of this development, countries of great old civilizations such as Germany and Italy, whose languages are perfectly capable of expressing all the nuances of scientific thought, have already accepted, without any particular reservations, the English language as the means of scientific communication.

The reasons for the decline of French in favor of English as a scientific language have often been pondered. The complexity and rigidity of French grammar and historical evolution have been cited. The principal reason, which deserves emphasis here, is the very high quality of scientific research in the English-speaking countries during the last decades. By contrast, it is observed, for example, that owing to the eminent position occupied by the French school of mathematics, there are still many mathematicians around the world who make use of French and are often even able to express themselves in French.

(1) With the exception of the publications of the eastern countries and the Soviet Union.

Finally it must be noted that the English of the men of science is an English, or, rather, an American [English] that is simplified, with a limited vocabulary and a rudimentary grammar, a very different language from that of Shakespeare and of the great Anglo-Saxon authors. To acquire the elements of this scientific English that permit sufficient oral and written expression is rather easy, because in a scientific account or discussion it is not eloquence or elegance that counts but the fundamental reasoning.

(c) THE FUTURE OF FRENCH IS THREATENED

All those who care about the future of our language, and in particular all the members and corresponding members of our Academy, are today greatly concerned about a triple threat that weighs at this moment on the destiny of the French language, and they believe that its defense is an imperative of priority. They are determined to participate in action for the survival of French as the national language of countries that are French-speaking today and as the favored means of expression of their cultural influence.

The first threat, an external one, is the result of the influence exerted by all that comes to us from the US due to its scientific, industrial, and commercial power, to be sure, but also because of its cultural vitality. Our scientific expression is not the only one affected, far from it. American products, fashion, films, literary and artistic works, songs from America, all mark our daily life. Our everyday language, of advertising and of the great vehicles of communication, the newspapers, radio, and TV in particular, increasingly incorporate into a “franglais” – which is often justifiably denounced – this input from outside, revealing in this manner a certain weakening of our cultural originality.

The second threat, this one internal, arises from the incapacity shown by our people to preserve its language in its traditional purity and accuracy. Even the privileged who have successfully taken examinations and [entrance] competitions fail sometimes to express themselves orally or in writing without murdering our language. Mastering the language, including respect for the rules of spelling and syntax, which used to be required of holders of diplomas, is no longer a major goal of our national education system, which seems readily resigned to the general laxity of our society.

The future menace is even more critical. Tomorrow, with the development of distance-broadcasting, every French-speaking person, not only in France but also in Africa, will be able to receive directly in English an extraordinary collection of information, cultural riches, and entertainment. The advancement of audiovisual means will enable the offering of real courses, at various levels and on all subjects, combining a set of slides and film sequences with instructional commentary that will be, for everyone but most of all for the developing countries, a highly valuable and efficacious means of education. This enterprise is already in the making in the US. How can such facilities, such advantages, be resisted, especially by those for whom the deepest roots of the French language do not go back to a tradition that is even older than a millennium!

But for us who know that our French language constitutes our cultural identity and that its vitality is the necessary condition for the continued expression of our people’s genius among the nations, the defense of our threatened language is at the highest level of our requirements.

Now, the French scientific community, sharing in the necessity of communication which is essential for the international scientific community, has already accepted to a large degree the fact that English is the preferred international language of science. To those who recognize the essential imperative of

defending the French language, does it not appear that the French scientific community is the segment of our society that has already practically resigned itself to a kind of relinquishment? What attitude, what directives would be appropriate for the nation to adopt toward this French scientific community?

2. THE MAIN OPTIONS

The major objective is the defense of French science, French culture, and the French language. There is agreement on this proposition, but a large variety of opinions have been expressed concerning the hierarchy of imperatives and their consequences. They can be grouped under three headings.

(a) INTRANSIGENCE

In the mind of one group the defense of the French language is considered as the absolute priority to which even the interests of French science must yield. The supporters of this conception denounce the abandonment of the French language as proof of defeatism. They assert that work of high quality is always read and appreciated, even if it is written in French. There is a hardline variant of this frame of mind that would want to forbid the use of the English language by French researchers under any circumstance.

It is useful to assess the consequences of such a decision. If we adopted French exclusively in addressing foreign scientists, what would happen? We can eliminate the possibility that as a result of our decision all countries would adopt French as the language in common of science; it is even less likely that the non-English-speaking countries, convinced by our example, would each decide to use its own language. We will therefore always have to learn the simplified English used by others in order to understand them, while resigning ourselves to being understood only by a few. French science would quickly lose its vitality. What would then become of the influence of French culture beyond the limited circle of the French-speaking countries?

(b) RESIGNATION

A second frame of mind places the manifestations of French science at the highest rank. The supporters of this conception consider it essential above all that French scientists be read, studied, and understood, and, accordingly, while the present situations may be regrettable, it must be accepted. In this view it is appropriate to resign oneself to dominance by the English language. Even more, it must be recommended to French researchers that they use English to express themselves, and the necessary measures must be taken that will allow them to do so in the best circumstances. A tolerant variety of this conception is ready to abandon immediately all expression, all scientific publication in French.

To accept to let the current situation evolve naturally without intervening would be admitting that French science could be dissociated from French culture, since each would be using a different language for expression. What would be a culture today that does not include scientific activity as one of its most lively constituents? The risk from the blow to our people and, even more, to those around the world who have chosen or accepted to shape their cultural future with our language in order to implant this future in the cultural soil that this language has created, would be fatal in the short or long term.

(c) THE REALISTIC OPTION

A third option brings together the scientists and researchers who want to avoid the disadvantages of the two extreme positions. It is this option, which is admittedly not rigid but is realistic, that has been unanimously chosen by the Academy of Sciences. Its supporters recognize as fact the preponderant use of the English language in scientific exchanges today, a fact intimately linked to the need of the scientific community for communication, this community now being, more than ever, international in character. But the supporters believe that language and culture cannot be entirely dissociated. They feel that the present situation is unsatisfactory; that ignoring the consequences of an evolution that is by no means recent has caused a lack of vigilance; that a clearer and more receptive policy to assure simultaneously the influence of French science and French culture could have been put in place; that there is still time today, but an urgency to act exists. These are the elements of this policy that form the subject of the last part of the present report.

3. PROPOSALS

TWO PRELIMINARY REMARKS

The proposals that will be made concern only the dissemination of French science and its connections to the influence of French culture and thereby the influence of the French language. But it must be well understood that the actions recommended will have no sense if they are not integrated at the national level into a general policy for the defense of French that, as has been said, must be developed on all the fronts where our language is threatened. It is not for us to give an outline of such a policy. But be it the support for the development of the teaching of French abroad and of the means by which French culture can express itself, or the safeguard of the purity and vitality of our language so that it preserves its qualities while remaining receptive to today's demands, there is a whole range of actions here, of which we can only emphasize the scale.

It should not be forgotten that the development and progress of French scientific research are certainly, in the medium or long term, the most adept means for the improvement of the situation of the French language. French scientific research that would recover the top rank in many domains (the example of mathematics shows it) would be the best vehicle for the progress and dissemination of the French language. The recently announced measures, the substantially increased funding of scientific research, provide some hope. It still remains however to assure the conditions necessary for the use of these increased resources to promote research at a very high level. Our Academy evoked these conditions in the "Message" addressed to the Colloquium of National Research and Technology.

These remarks having been made, the proposals will be presented in three parts, corresponding to the three sectors where action must be undertaken.

(a) USING ALL THE ASSETS OF FRENCH SCIENCE IN SUPPORT OF THE INFLUENCE OF FRENCH CULTURE AND LANGUAGE

The cultural benefits that can be derived from measures whose objective at first seems only concerned with our scientific development are too often underestimated. This first part of the proposals deserves

more attention precisely because their effects are both cumulative and multiplicative for the greatest benefit of French science, French culture, and the French language.

— *Hosting foreign scientists*

Students

It is clear that both in our universities and engineering schools we are not exploiting all of the educational capacity that we could use to host foreign students. The scholarships offered are too low, especially for students who have already received in their countries their first university education. More efficient methods of recruiting, such as those already used for choosing Japanese students in mathematics, or for the selection of engineering students in certain countries in Latin America ought to be generalized.

Professors and researchers

Our university centers and laboratories which enjoy a good reputation could also attract high-quality foreign professors and researchers for stays of relatively long duration, which are unquestionably the most profitable from every point of view. Often, these individuals will learn French if they do not already speak it, and make their children learn it.

It would be suitable to increase the number of available positions, to simplify the formalities and to reduce the delays. One can imagine creating in certain university departments or laboratories of very high level one or two permanent positions whose functioning would be monitored *a posteriori*. The Academy itself is ready to fund a few positions, for which it would take care of recruitment; there is no doubt that the prestige attached to the title of “Professor of the Academy of Sciences” would allow the recruiting of exceptional candidates.

— *Organizing high-level international events in France*

Summer schools

An already long experience at the École de Physique des Houches confirms the scientific and cultural value of such an enterprise. Even if English is the main language used in the courses and seminars, the researchers who participate in a session live in a French environment, learn to know our country, and begin an initiation into our language.

Conferences and Colloquia

It is an honor for a country to be chosen by international institutions for the organization of scientific meetings that attract the most prestigious scientists from the disciplines concerned. It is also an additional opportunity to acquaint the participants with artistic and cultural resources and the often unrecognized assets, and to give them a more accurate idea of French culture.

— *France’s place in international institutions*

It is fortunate that our country was a candidate for the seat of UNESCO to be permanently situated in Paris, and the advantages derived from it for our culture and our language are recognized. We must be

equally pleased by the fortunate initiative – encouraged at the time by the highest authorities of the state – that led the Secretariat of the International Council for Science (ICSU) to establish its base in Paris. We believe that the French presence within international scientific associations and international nongovernmental scientific institutions could be further increased if those who are invited to serve as officers, as president or secretary general, for example, were better helped and supported and thereby were more inclined to accept such invitations. The Academy is prepared to make proposals and is ready to provide help for their implementation.

— *Stays of French professors and researchers abroad*

A policy of broad approach such as that recommended above requires that the exchanges are developed in both directions. If since the last war our country has succeeded in regaining an honorable place among the nations of science, it is due in part to the fact that researchers have had the possibility of working in the best laboratories abroad, allowing French scientific research to benefit from the latest advances. This effort must not only be sustained but developed by adopting the methods that could facilitate the exchanges. A Frenchman who spends several months abroad is in a way an ambassador of French culture.

— *Development and strengthening of the scientific services in our embassies*

Well-engaged action must be pursued, even if it is only very recently begun. One is struck by the multiplicity of useful tasks that these services perform or could perform. A policy such as that proposed here for development can only produce all the expected results if the means for organizing, facilitating, and exploiting it are put in place in France and abroad.

(b) DEVELOPING EXPRESSIONS OF FRENCH SCIENCE AND TECHNOLOGY IN THE SERVICE OF SCIENTIFIC TRAINING AND INFORMATION IN THE FRANCOPHONE COUNTRIES

This second part on the proposals is essential. Just as French industry can only increase its exports if it can prove its ability to reconquer the domestic market, in the same manner, a policy for the international influence of science and technology of French expression must necessarily rely on a rich potential of dissemination and publications in the service of the francophone communities.

In the highly varied domains of scientific and technical education and information, it is necessary to assure and promote expression in the French language in every instance where there is a large enough public to welcome it and benefit from it. To offer in French all the reasonably available and useful means of training, information, and expression is the first condition that must be met for the French language to assert itself as a scientific and technical language and thereby to have hope to increase its influence beyond the circles of the francophone world. Too often this obvious fact goes unrecognized, even by our national institutions. The current situation is so inadequate that initiatives and support from governmental authorities are needed, at least for a time.

— *Works and journals of education*

Books on the science of classical and technical secondary education can be decisive in vocational guidance. They must be not only accurate and clear, but also attractive and well adapted to the target audience. There is no doubt that better coordination among francophone countries would allow them to make better use of the enormous effort of the authors.

At the level of the first two years of higher education, the technical schools and the engineering schools, the current situation is frankly poor. We have an exceptional force of professors; they are able and experienced and relish improving their courses and devote a great deal of time to it. It is therefore paradoxical to find only a small number of easily accessible published works aimed at the conservation and wide dissemination of the findings of their work.

A series of causes thwart this normal and desirable outcome of the effort made: the print runs are limited; the prices too high for our students and even more so for those in the countries of Africa and Latin America who desire to purchase them; and French publishers have not reached the size and solidity of the large science publishers abroad. The prospective authors are therefore led to give up, sometimes against their will, and turn to other means of reaching a larger audience when such means are available. But this course can be reversed by intelligent, determined, and continuous action fueled by the belief in the importance of the goal and sustained by some appropriate financial means, for example to allow developing countries to purchase at moderate prices the educational works they need. *It is in fact unfortunate that their young universities purchase books in English for simple budgetary reasons.*

— *Technical and specialized journals and works*

Considerable efforts have already been made by technical research centers, technological associations, and industries, as the dissemination of achievements of French technology is a decisive factor for raising the technological level of the nation and for the development of exportation. But these efforts must be further increased. There exist in effect a very large number of technical publications in French – monographs, bulletins, journals – aimed at the needs of the professions. But some of them, often due to the lack of sufficient means, are not able to assure practices of desirable quality and rigor, nor to reach a sufficiently large audience. Moreover, the engineers and researchers are not sufficiently convinced of the importance of writing and publishing articles aimed at a large audience which might be demanding and critical, and the leaders of the firms where they work do not encourage them to do so. This is one of the reasons – but certainly not the only one – for which we do not have an adequate number of high-level technical journals in the French language, despite the large number of French-speaking readers who would be interested. Action by government agencies is necessary and desirable for the encouragement of the development of quality technical publications.

— *Popularization activities*

The importance of such activities seems to be well recognized today. The initiatives are numerous and we must be pleased by this situation. Certain ambitious projects such as the center of science and industry of La Vilette [near Paris] show that the governmental authorities are determined to act.

But one example will indicate the progress that still must be achieved. A series of works has just been launched for an audience, well-informed, certainly, but not very large, in particular professors of science in secondary education. The first three books are excellent, written by great scientists, taking very much into consideration the expected readership. But the print run remains less than 4,000! The prices are still too high, and the goal desired is thus far from having been completely reached.

— *National scientific events*

Thanks to initiatives by scientific societies or national institutions, scientific meetings are organized in France for the French scientific community. These initiatives must be promoted; special assistance should be provided that will allow wide-ranging invitations of scientists from the francophone countries.

— *Audio-visual documents*

We have recognized in the current development of audio-visual technologies a very serious future threat to the long-term survival of French in certain countries, particularly in Africa. Therefore, this is a domain for action by governmental authorities that appears to us of priority. It is certainly necessary first to encourage and support the few favorable initiatives that have been started, but there is also a great deal more that needs to be done; the francophone countries should be made aware of the importance of the stakes; a list of the most urgent actions should be drawn up; some flexible but well-endowed structures should be put in place that are capable of generating projects, assisting in their realization, and assuring dissemination.

— *Enhancing the value of these scientific resources by translation*

At the end of this section devoted to the totality of activities of training and information in the service of the francophone countries, actions which call for the French language to be used as a means of expression, it should be emphasized that this rich resource of books and documents widely disseminated in the francophone countries – and therefore tested – are the basis of potentially successful translation activities, into English certainly, but also into Spanish and perhaps into other languages. The best French scientific publishers already have a certain amount of experience; however, in this domain a considerably more dynamic policy is needed and possible.

The success of the set of projects that have just been mentioned depends in large measure on the quality of the men of science who will accept to participate; now, the best of them will be interested, and more and more of them will be interested as we assure for the works that they will produce a dissemination that is equal to the their quality. This, unfortunately, is not often the case today.

(c) ASSURING THE FRENCH PRESENCE IN HIGHLY SPECIALIZED SCIENTIFIC MEETINGS AND PUBLICATIONS

This third sector of action concerns the French scientific community in its exchanges with the international scientific milieu in matters of highly specialized work. The field of impact of the actions to be undertaken in this regard, in comparison to the impact of the measures recommended earlier, is much smaller. The advantages eventually expected cannot have a scope comparable to those that one can expect from a policy that benefits from our scientific potential to increase our cultural influence and from a policy that develops all the expressions of our science in the service of education and information in the francophone countries.

Nevertheless, this is the terrain that immediately polarizes the atmosphere as soon as one speaks of scientists and the defense of the French language. The use of English by a large number of researchers – in relationships that are however extremely narrow and affect few people – is viewed by some as scandalous and blameworthy. The matter becomes symbolic. On the questions thus raised the opinions in the scientific community and in the Academy vary and are at times conflicting.

In these sometimes passionate debates one should never forget that the stakes concern only a relatively minimal part of the totality of questions raised by the defense of the threatened French language.

Therefore, one should not inflate the importance of the differences that can appear, nor undertake efforts in this regard that would not be proportional to the hoped-for advantages and would be to the detriment of actions that would be fruitful in some other ways, such as those proposed above.

The supporters of intransigence or resignation would naturally lean toward monolingualism, the former choosing French and the latter English. We have rejected these inflexible attitudes in favor of a more nuanced position according to which French and English could be used by scientists in their specialized scientific relationships. But there are also a great many ways to convert this position into facts, one of them being recommending a bilingualism in which English and French should be used simultaneously in special situations, which are more or less frequent. To go beyond these generalizations would require distinguishing the different situations.

— *Official texts and records*

The use of French should be required (along with other languages eventually) in all the official texts of the scientific community, for example, in those that define the statutes of ICSU and scientific associations. The privileged status of French as one of the official languages of international organizations and international conferences must be conserved and, if necessary, defended. French scientists must also use French whenever they are called upon to officially represent their country.

Apart from these important but limited cases, the Academy believes that it is not desirable to impose restrictive rules on researchers. It is preferable to allow the scientific community and each of its members to have freedom of choice in the means of expression. It is however necessary that in return this choice should be actually possible and free, which implies the institution of a certain policy.

— *Specialized international scientific meetings (Congresses, conferences, colloquia, etc.)*

Contrary to an idea often put forward, the Academy considers it unwise to recommend to French researchers to demand or impose simultaneous translation in all circumstances.

The translation of specialized scientific communications is an extremely delicate operation that rarely gives satisfactory results; it is moreover a very expensive undertaking that requires either special subsidies, to the detriment of more cost-effective actions, or a substantial increase in the registration fees, which discourages the participation of young researchers.

On the other hand, one can recommend to the participants to avoid all snobbism. While it is normal that a Frenchman speaks in English during a meeting where the majority of participants do not understand our language, even if this meeting is held in France, it would be senseless on the other hand for him not to present his communication in French in cases where the majority of the audience speaks French. It should also be recommended to organizers of meetings held in France that the announcements of the meeting be written in French and English.

The organizers should also be asked to take steps to assure that if there are French participants who do not understand English they can nevertheless take part in in the proceedings in a worthwhile manner (1).

— *Specialized monographs*

The proliferation of articles and communications makes specialized monographs appearing in collections – regular or not – and review articles particularly useful. Their quality depends on the perspective and the competence of the author. Almost always, the author acts in response to an invitation. The interested audience, always relatively limited, is spread around the globe. The language that allows the largest dissemination of the works is, quite generally, English.

The influence that the author of a successful monograph can have is considerable. One should therefore be pleased if French professors and researchers are chosen by a publisher or a collections editor, and they should not be reproached for writing in English.

It would certainly be of interest to find additional publishers with centers of operation in France possessing the needed scientific and commercial stature to undertake such initiatives. Despite the unquestionable progress already made, French publishers have not yet attained the power and dynamism of the great foreign scientific publishers; however, it would undoubtedly be possible to improve appreciably the situation. Monographs launched after prior study, since a level of excellence must be maintained, should be published in French and English, with the translation and English publication being assured either by agreement with a foreign publisher or by a the French publisher itself.

To encourage teachers and researchers who are capable of authoring works of recognized interest, it would be useful to excuse them for a period from all or a part of their professional duties.

— *Specialized scientific journals*

Scientific creation generally achieves concrete form in articles and communications. The first goal is to assure that the originality and the quality of the results are known and recognized by the largest number of potentially interested individuals. Consequently, the authors are tempted to publish in the most reputable journals, i.e., those most widely disseminated and read; even in cases where such journals do not require the use of the English language, the author will be inclined to write in English in order to achieve the desired objective. The scientific staff of the great international publications, their editorial boards, and all the experts called upon to examine and critique the manuscripts constitute today the most powerful centers of scientific evaluation of the international community. It is therefore important that French scientist be involved in such activities, and, if possible, be involved closely. Those who are invited to participate should be encouraged to respond affirmatively.

(1) For example, they should ask the speakers to bring the printed text of their presentations or at the very least a substantial summary, and methods should be provided for reproducing them for immediate distribution to the participants, who in fact could have difficulties to follow oral presentations in English for reasons of pronunciation or acoustics, while they can follow more easily the written text.

The reservations expressed above on the general implementation of simultaneous translation should not be understood as its disapproval in all cases of scientific or technological meetings. The reservations do not apply, for example, to conferences or meetings where the audience is largely industrial engineers, who use English to a lesser extent than scientists and who are more accustomed to a more “luxurious” environment in meetings.

More determination needs to be applied in encouraging the initiatives of French scientists who have created and maintain high-quality scientific journals that have their center of operations in France and have international standing. The importance of such scientific and cultural stakes has been thus far unappreciated. The help and support that have been provided to these journals have often remained pitiful. It is difficult to understand why those in charge of French science have not paid the needed attention to this component of our scientific influence.

Some of these journals are multilingual, in fact practically bilingual, in the sense that variable proportions of the articles are published in English, and, depending on the journal and the discipline, this proportion can vary from 40 to 85%. Contrary to the view sometimes put forth, it is normal and even desirable that these journals should be encouraged and supported – better than they are today – provided that they in fact guarantee the possibility of publishing in French. The fact that the headquarters are in France is of the utmost importance.

Other journals publish only articles and communications in French. This is notably the case of our *Comptes rendus* [the proceedings of the Academy of Sciences] which, as is known, is reserved for short notes, in which a first announcement is made of a new and significant result. For obvious reasons, it is important to have French scientific journals and it is a good idea to support them strongly, on condition however that their scientific level must be indisputable and that the articles must include English summaries that describe quite precisely the objectives of the work and the major findings.

The possibility of promoting the most worthwhile of these journals by providing them with the means to publish an English edition or to appear in bilingual form is currently under consideration. The first studies that have been carried out show that this undertaking poses considerable problems, not only of a material and financial nature, but also in the preparation of text in English. The increase in the number of subscriptions that may be expected from such a transformation is at this point rather uncertain. It is even possible that the initiative carries the risk of reducing the dissemination of French science in French, which would be the opposite of the objective intended. Moreover, what would be the reaction of the authors who would have, after all, the responsibility for two versions?

The same possibility can be raised in regards to our *Comptes rendus*. Some foreign authors would certainly be tempted, in higher numbers than today, to entrust to the *Comptes rendus* the announcement of their new results. But the unwieldiness of such an operation and its unpredictable consequences leave our company, at least for now, rather reluctant to reach a favorable opinion on such a move. Most of us believe that if an effort must be made to render our publication more accessible to the researchers who do not read French, it would be better to opt for the introduction of longer summaries in English. However, a decision of this kind cannot be reached if the service of the *Comptes rendus* does not receive the support necessary for the verification of the precision and accuracy of the English text.

— *Technical publications*

Technical and industrial research poses problems of a different nature and therefore calls for different actions. Since it is intended primarily for French companies and is carried out in close coordination with their needs and market interests, it has less of a need than does fundamental research for immediate visibility on a wide international scene. Publications of such research therefore rely on the French language.

We have already recommended above a vigorous action for increasing the quality and influence of technical publications. Here we simply want to add that translation functions, more or less systematic, could be envisaged as a priority for articles, monographs, special issues, or certain very-high-level journals likely to familiarize the readers with the resources and the results of French technology.

In conclusion to this third part of the proposals, the Academy believes that it would not be reasonable to engage in substantial and expensive activities whose results would not be in proportion to the benefits that could be obtained with the funds if they were invested in operations that would better serve French science and French cultural influence.

But the freedom of choice advocated for the benefit of scientists must find the conditions in which it can be genuinely exercised. This freedom requires first the possibility of publishing in French in collections or journals of high quality and of sufficiently wide distribution, which in turn requires an energetic policy of support of the initiatives by competent teams of scientists that are willing to take on such responsibilities. Second, this freedom must be free of any sectarianism and conformism, specifically by the authorities that evaluate the activities of laboratories and researchers. These authorities must judge the work on the basis of the evidence and without taking into account the language in which it was presented or the popularity of the journal where it was published, and without reneging on their responsibilities by using the often misleading citation indices. Our scientific community does not lack individuals with the necessary culture, experience, and judgment for producing authoritative opinions; it is among such individuals that the members of the commissions charged with assessing the scientific value of men and groups must be chosen.

CONCLUSION

The Academy of Sciences assesses the threats that weigh on the destiny of our language. These threats require national recognition and a political resolve that affect the entirety of our cultural life, its expression and influence, in every domain where it is manifested, and that go well beyond the limited range of practices of French scientists.

On the whole array of questions raised by these considerations, our Academy, after having collected and studied the available opinions, has adopted a concrete position. The Academy distances itself from both the intransigence that would forbid the use of English by our scientist and the resignation that would passively accept the continuing decline of French as a language of scientific work.

The Academy recommends a realistic and vigorous action that should be able not only to stop this decline but should in addition permit the beginning of the revival of the use of French within international scientific life.

First of all, it is necessary to deploy for the benefit of our culture and our language all the assets provided by the good standards of our science and technology and the reputation we thus earn:

- to host foreign students, professors, and researchers;
- to attract to our country institutions and men of science by organizing conferences, colloquia, and summer schools;
- to maintain and develop the presence of French scientific and technical thinking, in particular by virtue of the activities of the scientific units within our embassies, the importance of whose role ought to be better recognized, their mission extended, and their means increased.

Second, it is necessary to promote the expressions of science and technology in French in every justifiable case, that is, wherever a francophone audience of adequate size exists. Such expressions include scientific works of secondary and higher education, technical publications, national colloquia, books of popularization and, on an immediate basis, the publication of audio-visual documents. One cannot hope to make French a great international scientific language if one is not capable first to respond in French to the legitimate needs of the francophone world. The effort needed in order to succeed in this is large and assistance by governmental agencies is indispensable.

Finally, concerning specialized scientific communication, the Academy makes two recommendations. First, it is necessary to encourage and vigorously support, and without imposing a burden of language restrictions, those who are actually willing to organize international meetings, launch monograph series, or publish an international-level journal. What is essential here is to have a large number of such high-level activities headquartered in France. Second, it is suitable to allow the researcher the freedom to use on all occasions the language he deems appropriate and to trust him in these decisions, but one must be vigilant that he is not unfairly penalized whenever he chooses French to do so.

The Academy believes that French scientists, as those around the world, must, of necessity, know and master at least that simplified English that has become the international language of science. Far from preventing them from doing so, it is important to help them in that task.

In the present report the Academy desired to outline the goals; it does not seek to specify the decisions that need to be made by governmental agencies to bring about the ambitious policy recommended by the Academy. It is certain, for example, that some initiatives are indispensable in order to provide our country with scientific and technological publishing houses capable of competing one day with the mightiest foreign publishers. There is also no doubt that an organ must be created that is charged with the dissemination of French scientific books in the francophone countries and abroad.

The Academy, however, warns against any temptation to create too hastily institutions that could very quickly turn out to be too expensive in comparison to the services rendered. For example, it is necessary to help the authors who have to write works, monographs, articles, or extensive summaries in English by providing the means to check the accuracy and quality of their text; the translation into foreign languages of scientific works or technical publications must also be developed. Should therefore a National Institute for Translation be created, as some have recommended? The majority of the members of the Academy estimate that at this time such an initiative is premature. It is better to proceed more gradually, more experimentally, for example, by allowing researchers who know English well and who are willing to accept, perhaps temporarily, to take a break from active research, to be called upon to perform the functions of “scientific translators” for institutions in need of such services.

The Academy hopes that in this matter of the use of English by the men of science, the suspicions, the accusations, and the clashes, which carry the risk of dividing the French scientific community, will stop. The energies expended would thus be freed and could be advantageously mobilized for the concrete objectives that we have drawn attention to and that are much more promising for the defense of our language and for the influence of French culture. The men of science can bring indispensable help to these objectives, even if they use spoken or written English in their communication with scientists of their specialties. It is enough to invite and help them. They are ready to act.

TRADUIRE

REVUE FRANÇAISE DE LA TRADUCTION
INFORMATION LINGUISTIQUE ET CULTURELLE
ABONNEMENT 1983, y compris l'Annuaire S.F.T. :

Rédaction et administration :
C.T.I., 1, rue de Courcelles - 75008 PARIS
C.C.P. Paris n° 9728-01 Y.

TRADUIRE

Revue française de la traduction
Information linguistique et culturelle
No. 116, Summer 1983

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COLLOQUIUM

Should the national languages be saved?
The role of translation and interpretation
June 23-25, 1982.

Organized by the École Supérieure d'Interprètes et de Traducteurs [Higher-Education Establishment of Interpreters and Translators] (University of Paris III) and the Groupe d'Étude du Langage [Group for the Study of Language] (University of Paris XII).

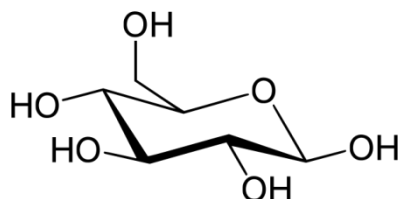
In charge of this issue: Florence Herbulot
Published with the help of the High Committee of the French Language

Language of science or science of languages:
Multilingualism or single language?
The point of view of a user

J.-M. Lehn
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Chair of Chemistry of Molecular Interactions

One can, first of all, ask whether the sciences in fact have a need for a linguistic medium other than their own language. This is especially true for chemistry which can be written and read without the help of any language other than its own.

For every chemist, $6 \text{CO}_2 + 6 \text{H}_2\text{O} \rightarrow \text{C}_6\text{H}_{12}\text{O}_6 + 6 \text{O}_2$ represents the total balance sheet of the formation of glucose during photosynthesis. But glucose is written in a pictogram that is the accurate representation of the actual disposition of the atoms, i.e., the geometry of the glucose molecule.[§]



In the same way, the transformations that convert one chemical compound into another are represented by diagrams that have no need for any word to be clearly intelligible.

Chemical language is symbolic and pictographic, but not in the manner of ancient Sumerian. It is a language whose symbols are 3-dimensional and represent the real 3-dimensional structure of chemical species. It is a language in which a word is a molecule formed by a collection of letters, the atoms, in a clearly defined disposition in 3-dimensional space. But the molecular representation is not simply symbolism; it describes a perceptible reality, it is the reification [concretization] of the word and the text, it is a sign imprinted in the matter.

This language does not need to be translated, it is understood in every country. It was created in its simplest form by the Swedish chemist Jöns Berzelius (1779-1848) at the beginning of the 19th century, and has since been enriched by the contributions of a great many chemists. It currently has a dictionary of about five million compounds, five million words, and thus has a more extensive and richer vocabulary than any language.

In fact, every chemist has the power to invent new words, to print new sentences in the book of matter. New words indeed, since they did not exist before being created by the rearrangement of atom-letters into new and infinitely varied combinations and structures – an *opera chimiae* [chemical work] – that express their creative power, as Marcelin Berthelot said: “Chemistry creates its object. This creative faculty similar to that of art itself”.

Letters, words, symbols, structural representations, formulas, equations, the vocabulary, the grammar, and the syntax of chemistry are universal. With [the languages of] numbers, musical notes, alphabets, and gestures, the chemical language is a fifth language. In fact, it functions both as a system of signs [implied by the word “*langue*” in the original] and as expression of thoughts [from the word “*langage*” in the original]; if, as Roland Barthes wrote, “*langage* is legislation, *langue* is its code.”*

There is food for thought here on *molecular semiology*, on chemical symbols, sentences, and discourse, on reading and writing them.

But if the spoken and written language is not a *necessary underpinning* for communicating in chemistry, it is very much that for other sciences; and for chemistry it is at the very least very useful and, quite obviously, very widely used. The question therefore remains: which language to use in written and spoken science? I would answer: not a single language, but that which is understood by the majority of the audience, on condition to be sure that one is able to use it appropriately. Because it is above all a matter of *communicating*. The first obligation of the language is to serve the dissemination of science; it is not the role of science to defend the language.

To ask whether the universal use of a single language is at the detriment to other languages and other cultures is the wrong question. It depends. It depends on whether the audience is specialized or broad; on whether one is writing for one's peers or for a wide public. What is said in colloquia and seminars, what is written in specialized journals bypasses the problem. The language used by the scientist when speaking or writing to the limited circle of his colleagues is without great influence on the vitality and fate of a language and a culture. This is in part because the sciences have their own means of communication whose linguistic basis is a secondary characteristic, an external form, in a manner of speaking.

Nevertheless, there is a place where the scientist can and must enrich his language, and that is by making an effort to be in harmony with the language when constructing the words he needs, words that will be picked up again and will carry the message of a scientific discovery.

It is most illusory to wish to coerce scientists to listen to talks delivered in a language that they do not understand. They will react with passivity, and the lecture hall will empty. This may be regrettable, but it is a fact.

In practice, a much more effective way to defend and spread a language and a culture of a country in parallel with its science is through collaboration programs and international exchanges. My experience with the ca. fifty researchers who trained in my laboratory has convinced me that encouraging international exchanges is without a doubt one of the most effective ways to publicize the activities of French laboratories, to promote the French language and culture, to establish personal or professional relationships that will further amplify the effects of the exchanges. French scientific renown is due first of all to the research carried out in France; every foreign trainee attracted by that renown will be a vehicle for the dissemination of the language and culture. Effective and high-quality publishing can also contribute significantly to that goal. Every researcher likes to speak and write in his language, but the fundamental task is to communicate; I think that the scientist will know how to best use the means at his disposal to reconcile the two.

The scientist accepts his responsibility toward his language and culture when the communication is broadened to wider audiences and to journals of a broader community, and the more so as the circle is enlarged. Thus, in presenting talks or writing in his own language, in using the terminology and expressions, and in coining new words, the man of science not only contributes to the spread of his language but even enriches it, all the while communicating his knowledge. In front of a large group of listeners and readers, he can strengthen the vitality of his language and culture just like other fields of activities do, e.g., the letters, arts, technologies, lifestyles. However, while science profoundly permeates our civilization and our lifestyle, the number of men and women who practice it is relatively small. Communication between nations takes place only to a lesser extent via scientific communication, unfortunately, it should be said.

To hope to use scientific communication to force the expansion or to maintain the vitality of a language is a false calculation. One consequence of the secondary role of language in scientific communication is that in return the impact of science on the language is weak in comparison to the impact of other forms of human activity.

But the vitality of a language and a culture cannot be without a very active science, whatever channels the science uses for its spread. In return, a science of high quality that is *known* to be such will render the language and culture of the country more appealing.

The scientist is therefore confronted with the need for a skillful judgment in the choice of subjects, language, and the terms used. He can rightfully ask for complete freedom in the choice of language used in communicating with his peers, but when it comes to his own language and culture he has the responsibility to make his knowledge and the findings of his work accessible to the largest number of people in his linguistic community.

The best method for a scientist to participate in the defense and display of his language and culture is to do the best science possible and to communicate it to the largest audience, regardless of languages or cultures.

To conclude and summarize this brief contribution, I would reaffirm a basic principle: “science is supranational” and its corollary: “language must serve science and not the other way around”. Science must be independent of nations, cultures, and languages, as well as of all political, economic, and social powers.

Finally, a few suggestions (not a comprehensive list) may be proposed, as follows.

1) Let scientists use within the international scientific community the means of communication that they judge to be suitable, their first obligation being communication.

2) Scientists should be encouraged to use their language, whatever it is, as often as possible, *but* compatibly with the obligation to communicate.

3) Scientists should be urged that when creating new words they do so in every case in harmony with their language, or, better, using roots common to several languages.

4) Scientists should be encouraged to publish in their language articles intended for broader audiences; in this manner, the use of one’s own language occurs first at the interface between science and the linguistic community.

5) The attention of readers should be attracted by enticement, e.g., multilingual summaries or short preliminary publications in English; to make the science of a country appreciated it is necessary first to make it known! If it is true that in general a piece of valuable work will become known sooner or later regardless of the language or journal used for publishing it, it is nevertheless preferable to facilitate its dissemination by methods of communication accessible to the largest audience.

6) It is suggested that the publication of general scientific journals of high quality and rigor aimed at a wide audience be facilitated, and that the translation of foreign works be supported.

7) It is recommended that programs of collaboration and international exchanges be promoted.

To finish, I will express a wish, namely, to urge people in the largest numbers to learn as many languages as possible and that support be given to the teaching of foreign languages, the key to opening up to other societies.

As for science, it imposes interdependence and compels opening up; as a major treasure of the heritage of humanity, it creates ties among peoples, among cultures, and therefore among languages!

§ This graphic is reproduced directly from the original —JG.

* One sentence in Lehn's article has been particularly challenging to translate, namely "En fait, langage et langue à la fois, si, comme l'écrivait Roland Barthes, 'le langage est une législation, la langue en est le code'". Barthes was an eminent French literary critic, philosopher, and linguist. "Langue" and "langage" both can be translated to the English word "language". However, in French, there are subtle nuances that distinguish the meaning of these two words not captured by the use of "language" for both. Given that Professor Lehn chose this particular quote of Barthes for his (Lehn's) purpose, we sought Lehn's counsel as to the meaning he was attempting to communicate. Lehn agreed with the use of "system of signs" for "*langue*" in the present context (in general, "*langue*" can be translated as "tongue", i.e., both the anatomical organ and language) and "expression of thoughts" for "*langage*". —JG