

# Problems of Arabization in science

Abdel-Aziz Ibn Abdallah

After four centuries of Ottoman and Western colonization, the Arabic language — which is nevertheless regarded by eminent orientalists as having made possible the first progress of science in the Middle East — became rigid and ossified. All efforts to give a new impetus to Arabic and put it on an equal footing with modern Western languages have so far proved ineffective. The gulf of four centuries has led to a lack of a large number of neologisms in modern Arabic (only about fifty new terms) (1) in all branches of science and technology. The author describes a method of solving this problem of communication.

The rapid development of science and technology has raised terminological problems which even the most highly developed countries are finding it difficult to solve.

France, for instance, despite the rich potentialities of its vast linguistic heritage, and despite the work of dozens of specialized lexicographical bodies, has been only partly successful, by dint of considerable efforts, in making good the gaps in the contemporary French vocabulary. Barely half the 18,000 new concepts brought into use by the discoveries of

the atomic age are expressed in words of French origin.

It is easy to visualize the situation in other European countries and, even more so, the problems of developing countries in Africa, Asia and Latin America and, in particular, the Arab world, in spite of the fact that the exhaustive terminology of Arabic left its stamp on technical progress and on the experimental sciences throughout the Middle Ages and at the beginning of modern times.

This is a linguistic problem with which the world

(1) According to statistics published by Unesco

in general is contending but it is particularly acute in Arab countries because of the large number of dialects. This accentuates the difficulties and sometimes rules out any possibility of adapting and, above all, unifying the language.

● **Filling a serious gap**

What have we done to escape from this dead end which is increasingly becoming a labyrinth for all nations, whether developed or developing ? The ways and means of adapting the vocabulary increasingly depend on the real potential of each nation's laboratories and research workers. The national language is like a looking glass reflecting the national research and development effort in the field of scientific discovery. In this context, what approach is advocated in the Arab world to the problem of remedying this serious short-coming, even if only partially ?

Arabs have in fact been studying this problem since the beginning of the century and have tried to provide their language with a suitable scientific terminology. But this very commendable and productive endeavour has often come from isolated conflicting initiatives sometimes giving rise to a wide variety of terms to express a concept which is rendered by a single word in French or English. Such a multiplicity of terms is likely to lead to confusion, since the existence of a profusion of synonyms is no longer regarded as a sign of linguistic richness or as a reflection of the inherent quality of a language. This is why Arab academies and universities which used to work in isolation, in their own ivory towers, are today trying to co-ordinate their efforts within a single academic federation, although progress in this respect is still limited and unduly slow. This federation will have an essential part to play in modernizing the language and, in order to be effective, should make a concerted approach to the work of lexicography to make good present deficiencies and eliminate dupli-

cation and inconsistency, since technical language admits of no vague or imprecise terms

The main emphasis at present is therefore on co-ordinating the work done by linguists and lexicographers under the auspices of the League of Arab States or the Arab Educational Cultural and Scientific Organization (ALECSO). The first move in this direction, designed to strengthen the trend towards unification and to up-date newly coined Arabic technical terms, was made in North Africa in 1960. During a visit to the Near East in the same year, King Mohammad V realized how seriously modern pragmatism would distort our development if our technical progress in the social and economic spheres did not bear the stamp of a distinctively Arab spirit mediated through the language of the Koran, the sacred book of Islam.

— Standardization of technical terms

An Arabization congress was held in Rabat in 1961 and was attended by all Arab countries and by the League of Arab States. The purpose of the meeting was to co-ordinate Arab efforts to standardize the scientific terminology of the language and to keep it up to date. This is a monumental and overwhelming task, a colossal undertaking calling for vast human and material resources. A living mechanism has to be set in motion and endowed with a new spirit so as to harmonize the efforts of Arabists and of native speakers of Arabic for the attainment of practical results. Such an undertaking requires planning based on a methodical inventory of our linguistic heritage which must be rationally listed, arranged and classified.

This substantial task, which involves setting up a carefully devised infrastructure, has devolved upon the Permanent Bureau of Co-ordination of Arabization in the Arab World (PBA), an inter-Arab organization working under the auspices of the League of Arab States with its headquarters in Rabat. Until 1967, a series of difficulties hampered the Bureau's initiatives and achievements, and for

because of the multiplicity of terms. The artificial nature of the divergencies between the two sectors of the Arab world is clearly exemplified in the differences between the syllabuses drawn up by the French and British who played a formative role respectively in the Arab Maghreb and Machrek regions. Each of the two Arab regions believes it is putting forward its own ideas based on its own options whereas in fact the difference of opinion is simply an after-effect of out-dated colonialism. The Arabic language is the essential basis of our unity, its principal intellectual underpinning, and it must be the moving spirit behind any modern development of the Arab nation. All the other components of this process are secondary. Self-critical examination by the Arab world, based on the real problems we encounter daily in our relations with one another, should pinpoint the essential technical features of the set of problems which we have already vaguely defined in a purely subjective way.

The problem does, however, have technical dimensions but, in the confusion of socio-economic revolutions and of their political and military repercussions, we are hardly aware of their scope and implications. For the past ten years, questions connected with Arabization have not received the attention they deserve. Every country or regional group especially in the Maghreb, is becoming increasingly embroiled in situations which cannot be resolved by partial or marginal measures. Improvised Arabization congresses cannot provide a rational basis for a long-term plan based on the principles of modern linguistics. There is a grievous lack of co-ordination on this matter as a result of short-comings at regional level although co-ordination is the essential starting-point for all planning. The ideal achieved by Syrian initiatives in the field of Arabization suffers from a lack of internal organization.

An effort must be made to approach problems objectively, courageously and in an

eminently scientific frame of mind. We must avoid systematically blaming colonialism for the disastrous consequences or our own amateurishness and defeatism.

#### ● Working out rational approaches

Even colonialists make no attempt to deny that imperialism is an evil in itself. But the fact remains that French culture, which gained a foothold in the Arab Maghreb to the disadvantage of our own North African culture, has given us a certain clarity and precision of thought. Our wish to raise Arabic to the status of a modern language prompted us to make the best use of the prevailing situation in the West and of the policy advocated for Western languages such as French or Oriental languages such as Chinese and Japanese, which have become regional instruments for spreading science and technology. We compiled our glossaries in a rational manner adapting them strictly to the requirements of technology. Scientific terminology is being Arabized, at a rated and in a manner determined by the necessities of our age, the aim being to achieve precision, clarity and thoroughness.

With this end in view, the Bureau of Arabization has considerably enlarged some of its glossaries (see Fig. 2) which are used in the Near East, on the basis of a constantly expanding range of ideas. The distinguishing features of each glossary we compile are terminological standardization and simplicity, and our adaptations take account of the universally accepted scientific meaning. Our fifty glossaries, a list of which is at your disposal, show the extent of the progress we have made and the considerable amount that still remains to be done in order to make the language of the Koran a scientific and technological language capable of satisfying the requirements of the atomic age.

Arabic has admittedly become a working language of the United Nations but we must

not delude ourselves on this score ; this step forward was essentially the expression of a political choice made by the Third World on the basis of ill-defined and debatable options. Our language most certainly stood the test in the Middle Ages, and it is the belief of eminent orientalist such as Louis Massignon that, just as it was an instrument of international communication in the past, so, in the future, it will be the vehicle of universal peace, and that its intrinsic value will be recognized in the concert of nations. But this does not mean that the problem is entirely solved ; we have only just begun to overhaul our language, an undertaking which should set us on a more certain course and provide us with appropriate resources, this time with the collaboration of all Arab countries.

Inter-Arab consciousness, and a faith confirmed by science and mediated through our language, are the sure guarantees of the efficacy of our work, which is that of the entire Arab nation. The standardization of terminologies is therefore a stage in the development of the Arab language ; it must be accompanied by standardization of syllables and of facilities for university research. The universal nature of science, the need to keep constantly abreast of scientific progress and to maintain a fruitful exchange of ideas on a world-wide scale are criteria which must be borne in mind in drawing up the terminology of modern Arabic.

#### ● Ways and means of carrying out this work

In conclusion, we must describe how we are carrying out our plan. The work has to be done in several stages ; first of all, Arabic terms and French and English glossaries and dictionaries must be examined and analysed ; a general file of the terms adopted will then be prepared and, lastly, a mechanized information retrieval system for Arabic will be set up.

#### — Analysing and classifying Arabic terms

We shall not be able to draw up an accurate inventory of the terminological gaps in our vocabulary until we have discovered the resources of our linguistic inheritance as it appears, often in crude form, in ancient glossaries. Some haphazard and incomplete surveys certainly show that a number of modern notions for which our academies are striving to find Arabic terms are already adequately conveyed by old terms used in pre-Islamic times and during the Omayyad and Abbasid dynasties and later.

Some of these terms are scattered throughout the confused mass of Arabic lexicographical compilations ; the lack of suitable Arabic dictionaries of ideas and synonyms makes our task a hard one. A complete inventory of all Arabic terminology will therefore have to be made to discover the existing gaps.

The new Arabic dictionary will therefore be complete and classified according to the accepted meaning of terms in a given subject order ; each word will be clearly and fully defined opposite its French and English equivalents.

Once this long and exacting task is finished, the new Arabic dictionary will reflect the colossal effort made over the past thousand years by our lexicographers, which now has to be carried further. This will mark the culmination of the PBA's venture to co-ordinate and standardize the Arab cultural heritage.

#### — Analysis and classification of French and English dictionaries

The analysing of modern French and English dictionaries is an essential preliminary step which will enable the vocabularies of all three languages to be compared and the gaps in each filled from the terminological resources of the others.

This partnership of languages on a world scale is one aspect of the harmonization of

several years it had to make do with very limited staff and equipment. The PBA's head, who began as Secretary and then became Director-General of the Bureau, then made a series of visits to Arab States to convince the authorities of the need for such an organization. At that time, most of these countries were not convinced, as they are today, that such co-ordination was essential. In addition, political or other disagreements continually hampered such co-operation while the Arab Maghreb was increasingly conscious of the imperative and urgent necessity of escaping from French influence which might easily be taken for a form of neo-colonialism.

This major problem was further exacerbated by the steady increase in the numbers of professional people trained in languages other than Arabic. In spite of the slenderness of the PBA's resources and the limited interest and encouragement which its endeavours received, the Bureau dutifully carried out its mission, following a clearly defined and rational plan. After ten years of unremitting effort a series of trilingual technical glossaries (Arabic, French and English) was published based on a vocabulary of Western terms and on meticulous analysis of the lexicographical resources of Arabic, particularly in the scientific field.

This involved filing hundreds of thousands of cards in alphabetical order, which were then arranged according to various specialized subjects (see Fig 1); this card index covers a large number of fields of study relating to all levels of education as well as to public service and specialized services. It was thus possible to embark on a comparative study based on reliable documentation; the method is being refined and the end in view is becoming more clearly defined. The Bureau of Arabization is becoming strict and even meticulous in its efforts to achieve consistency, exhaustiveness and, above all, efficiency. In the glossaries it is

important not only to avoid duplication and ambiguous synonyms but also to fill an immense gap by defining every Arabic technical term expressing a particular concept, only one

1306 - Congédié	(Fig. 1)
مشرح : معزول ، مفصول	
Dismissed, Discharged, Paid off	

such term being used (as in most Western languages).

We have proceeded by stages, without trying to rush things and, more particularly paying all due heed to the susceptibilities which sometimes tend to diminish the cultural contribution of modern civilization. We have embarked on a first series of volumes comprising terms without illustrations or definitions, with an index in two languages. The conditions required for the adoption of an Arabic or Arabized term are: simplicity, clarity, consistency with its English or French equivalent in a precise context which has no ambiguity or gaps. Neologisms must suggest the essential elements of the concept they express.

#### ● Pride in one's language

At this stage the question arises as to how far the new glossaries satisfy modern requirements.

Has the Bureau of Arabization really identified the source of all the gaps and anachronisms in Arabic, both on an inter-Arab and on a world level? Searching critical self-analysis was essential in order to pinpoint the real reasons for the paralysis and stagnation of our language, especially as the Arab world has for so long taken it for granted that Arabic is an instrument of civilization and a vehicle of science, so much so that it has remained blind to the short-comings and gaps revealed by the linguistic needs of modern times.

During the congress in Rabat to lay the foundations of the PBA, eminent linguists

Fig. 1. Samples of index cards in three languages, with a full explanation in Arabic of the concept of the terms indicated.

tried to reply seriously and with complete sincerity to a series of questions on the purpose of Arabization. The Arabic-speaking Maghreb then came up against the awesome obstacle of French influence which permeates and profoundly affects the entire superstructure of Maghreb society. Because of the Maghreb's position on the fringes of the Arab world, it was the only area conscious of the magnitude and danger of this anachronism. It had to turn to the Arabic-speaking East as the source of scientific works and textbooks which used the medium of Arabic to express modern scientific thought and which were used in a number of private schools in the Maghreb.

To co-ordinate and standardize this educational terminology we therefore started by inventorying the terms used at the primary level, taking as a basis the books approved by the various ministries concerned. In addition to this inventory, drawn up at our headquarters a second list is being compiled in each Arab country, covering, in particular, the scientific subjects taught in primary schools (arithmetic, object lessons, and so on). Egypt used its vast resources on this task for a year and made an inventory of the vocabulary of primary education. At the same time, we analysed officially approved French school books.

The results were fairly similar (7,000 to 8,000 terms), but with one striking difference: in the French books each term expresses a single notion, well defined as to content and scope, whereas the Arabic nomenclature comprises many synonyms, derivatives and variants—all standing for the same notion. An example is the list of words corresponding to the single French word *classe* :

حجرة = فصل = صف

The French book contains almost twice as many concepts as the Arabic one, so that a child in the Near East studying from Arabic textbooks acquires no more than half the

knowledge absorbed by his French counterpart. This situation adversely affects secondary schooling and also the over-all level of university education.

#### ● Split in the Arab world

Scientific research in Arab higher education would be seriously compromised if university faculties and higher-level institutions ceased to teach in French and English and, above all, to use bibliographical material in both languages. After a hasty effort to Arabize its teaching, the Syrian University of Aleppo adopted English as its teaching language. The less an Eastern student, whose education has been mostly in Arabic, knows of foreign languages, the narrower his field of reference, as very few scientific works are available in Arabic.

It need hardly be said that we are not blaming the Arabic language which, over the centuries, has given tangible proof of its effectiveness and potentialities. The main culprit is the Arab world itself, which broke up into two clans under the pressure of Western imperialism. Admittedly, these two groups believe themselves to be linguistically close, if not actually united, but in fact they suffer from divergencies resulting from radical differences between the different colonialist ideologies and tendencies which have profoundly affected them and which, in some cases, are exported specifically for the indigenous population. This is clear from a simple comparison between the technical glossary compiled by Damascus University and the one drawn up by the Cairo Academy: in one case there is the systematic invention of neologisms and, in the other, Arabization - in other words the straightforward adaptation of the foreign term; both are sometimes incomplete and inconsistent.

Science suffers doubly from this state of affairs: on the one hand, because of the frequent lack of precision, and, on the other hand,

modern thought and a crucial factor in the development of twentieth-century civilization.

— Card-indexing of Arabic scientific terms

Arabic or Arabized scientific and technical terms expressing all modern concepts will be brought together in a general file and classified in alphabetical order. Our archives already contain 200,000 cards relating to science, literature and the arts in the three languages. This is the raw material for three French-English-Arabic dictionaries which will be dependable works of reference and material proof of the effort that has been expended at inter-Arab level. The techniques used to compile other specialized glossaries from this general one will be described below ; the PBA has already published some of these, such as the legal dictionary (volume I, A and B), as well as the chemical, mathematical, physics and tourist dictionaries to mention typical examples

The League of Arab States and ALECSO will organize seminars and symposia to finalize the technical terminology adopted, which Arab States will undertake to apply in their respective countries.

— General Arabic-language dictionary

The culmination of this long effort of inventorying, co-ordinating, up-dating and standardizing, will be the drafting and publication of a general Arabic-language dictionary prepared along the same lines as major modern dictionaries, each entry being classified and explained in twentieth-century terms.

● **Technical and practical resources**

— Experts

This vast undertaking must be carried out by Arab experts ; at least three bilingual specialists with a thorough knowledge of Arabic and one Western language, preferably French or English, will be required for each branch of

science. Their work will be purely technical in nature and will entail collating Arabic and foreign terms and defining each term in the three languages. Mechanized information systems will be used for classification.

— Data processing

Projects on such a scale call for a very large number of scholars and qualified collaborators, who might have to work for decades. It is therefore indispensable to use data-processing techniques to enable the work of classifying and checking to be carried out as quickly as possible and under the best conditions. Our experts have explained our projects to representatives of major specialized firms and have discussed with them the technicalities of carrying them out rationally and speedily. It emerged that it was possible to synchronize all the required operations so that our basic work can be used in any future secondary compilations by means of a mechanized file comprising the words on the major list our services have drawn up. The firm which is to undertake this work will file all the terms in the big Larousse dictionary on magnetic tapes.

There will be two types of electronic classification : one of them alphabetical and the other by subject, that is to say in terms of the branch of science, literature, the arts or other fields in which the term is used. The words so classified will be collated with their English and Arabic equivalents, provided by the PBA, and they will be arranged in Latin and Arabic alphabetical order. A second phase of the work will consist in separating terms which have already been Arabized from those which have not, and the standardized Arabic or Arabized words from those adopted by the majority of Arab countries but on which there is still disagreement. Each category will be individually classified with all the necessary references.

The PBA will pass on all the terms culled from dictionaries, vocabularies or other publications to data-processing services for classification, first according to subject, using the procedure we shall adopt to compile the big Arabic analogue dictionary mentioned above and, secondly, in alphabetical order with a view to preparing the modern Arabic dictionary. All our specialized glossaries will be automatically compiled from the tape file and printed almost as they stand.

— Financing this undertaking

According to the initial estimates of a specialized firm, it will take eighteen months to analyse the contents of the big Larousse dictionary. The completion of these projects will depend on the funds made available to the PBA by Arab States.

● Conclusion

To sum up, the main guidelines of our plan are as follows :

— Establishment of lexicological files

Loading of the cards for each dictionary into its disc file, with intrinsic checking of the validity of the information recorded ; each of the three files includes all the glossaries compiled for the different specialities.

Sorting of files by word reference numbers and speciality codes.

Publishing of extracts for visual checking.

— Checking of the glossaries

Comparison of the three glossaries to check whether each word has been translated.

Identification of words used more than once for the same speciality.

Identification of words used in several specialities with the same translation.

Comparison of the glossaries with general dictionaries to identify words not found in the dictionaries.

— Updating of glossaries

Glossaries can be updated by :

Creation of words with their translation codes.

Changing of the translation codes or the speciality code of an existing word.

Cancellation of words in a given speciality.

Updating is followed by checking of glossaries, then by subsequent datings and checks until the glossaries have been completely revised.

— Various selections

A certain number of predefined selections will be made, based on general dictionaries or glossaries, or both.

— Publication of the glossaries

Two forms of publication will be possible :

One to four copies on ordinary paper.

One copy on special chemical paper, enabling several hundred copies to be run off on a special machine.

### Lexicological file

Each file unit comprises the following twelve items :

A reference number of one to six figures.

A code indicating whether the unit contains one word, a group of words or a commentary.

A code indicating the speciality.

The word or group of words, or commentary (thirty-five characters). A string code ; this code can be used only for groups of words or commentaries.

The code referring to the language

of the glossary (English, Arabic or French).

The code of the second language.

Two possible reference numbers in the glossary of the second language.

The code of the third language.

Two possible reference numbers in the glossary of the third language.

A number representing the organization or person who created the unit in the file.

The date of updating.

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Fig 2. Cover of a publicity leaflet advertising of Analogie Lexion, published by Dar Al-Kitab Allubnani.

— Couverture d'un bulletin publicitaire annonçant le lexique analogique publié par Dar Al-Kitab Allubnani.