

Progress to date in the Unesco programme for scientific
terminology and dictionaries

by

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1. Object of this note

Work initiated by the Department of Natural Sciences under the resolutions quoted below has reached a stage when it may be expected soon to fructify in practical results within certain of the fields cultivated by that Department. At the same time the principles proposed, and the procedural methods in which experiments are now being made, may be of value also for application in other fields, including some which come under different Departments in Unesco. This note has accordingly been prepared for the information of those concerned from either of these aspects, and to invite comments.

2. Initiation of the programme

In Resolutions 18.1 and 18.2 of the International Conference on Science Abstracting held by Unesco in 1949, it was recommended:

- "that adequate bilingual or polyglot dictionaries be provided for all fields of science and technology; and that they take account of national variations in usage and, if possible, be illustrated;
- that Unesco promote, in collaboration with the international scientific unions or other appropriate bodies, the standardisation of terminology and the publication at appropriate intervals of lists of new terms in science and technology, with definitions and translations in various languages."

These recommendations were accepted by the General Conference of Unesco, which authorized the Director-General in 1952:

"to further the improvement of scientific documentation by promoting the publication by the appropriate international organizations of abstracts, of interlingual dictionaries and of lists of scientific and technical terms".

The corresponding programme resolution which will be proposed to take effect in 1953 and 1954 would authorize him:

"to advise and encourage appropriate international organizations in defining and standardizing scientific terms, in producing dictionaries which will equate the corresponding terms in different languages and in improving the supply and availability of scientific translations".

3. Report and Bibliography: "Interlingual Scientific and Technical Dictionaries"

In response to the original recommendations of 1949 the present writer was commissioned under contract by Unesco to compile a report on the subject. This Report, under the above title, was given a limited circulation in mimeographed form under reference UNESCO/NS/SL/1 during 1950. At this point the writer joined the Department of Natural Sciences of the Secretariat as a staff member and in April 1951 a revised edition under the same title, amounting to 33 pages in English and 37 pages in the French edition, was placed on sale as a Unesco publication.

The published Report was accompanied by a separate Bibliography listing 1,044 dictionaries already published, these being arranged under 224 subject heads in accordance with the Universal Decimal Classification (mainly subdivisions of classes 5 - Natural Sciences and 6 - Applied Sciences) and cross indexed under 45 languages "from" and "into". A second edition, which appeared in October 1951, lists 50 additional dictionaries in a supplement appended. Further additions and corrections for possible later editions will be welcomed.

4. Discussion and adoption of the Report

The Report above mentioned has been the subject of conversations and correspondence with many individuals interested and with representatives of organizations projecting special dictionaries for their respective fields.

At the request of the Materials and Industries Division, Economic Commission for Europe, United Nations, it was circulated to members of a committee whose recommendation has now been adopted that a multilingual dictionary of MACHINE TOOLS terms will be prepared on the lines suggested, Unesco actively participating in the work and being thereby afforded the wanted practical opportunity to try out and perfect the methods described here in Section 7.

The Report was discussed by a special commission of the Nederlands Instituut voor Documentatie en Registratie (NIDER) which presented a paper on it at the Conference of the International Federation for Documentation held in Rome during September 1951. On the same occasion Dr. E. Wülster, Deputy Chairman of the Austrian Standardizing Committee for Terminology, who has been prominent in these matters since the publication of his book "Internationale Sprachnormung in der Technik" (VDI-Vorlag, Berlin) in 1931, gave a paper reviewing what has so far been done about them by the International Organization for Standardization (whose committee ISO-37 Terminology has just now been reactivated), the International Electrotechnical Commission, Unesco, the International Auxiliary Language Association (IALA) and the International Federation for Documentation (FID). At the Conference in Rome a special session on "Linguistic problems and terminology" was devoted to these submissions and a lengthy resolution was adopted recommending cooperation between ISO, Unesco and FID along certain lines.

Later in September the writer explained the Report and the practical experiments since made to a session of the International Road Congress at Lisbon which has decided to produce a revised and enlarged third edition of its existing seven-language dictionary of ROAD ENGINEERING terms, in which Unesco will now co-operate with advice.

In October 1951 the same ground was covered at a meeting in Paris of a committee set up by the newly formed Union of International Engineering Organizations (Union des Associations Techniques Internationales) to deal with documentation and dictionaries. Annex D to that committee's agenda is here appended. The Union is recommending its thirteen member bodies which are concerned with different branches of the engineering sciences to obtain guidance from Unesco on several dictionaries now projected, in hand or under revision. Among these, the first to use the proposed methods will probably be the international organizations concerned with WELDING, with DAMS (for the revised edition of a dictionary) and with civil engineering ancillary to NAVIGATION (for completing a series of "chapters" already published and well known).

Apart from the above the applicability of the proposals in the Report has been tentatively discussed with representatives of several other sciences. Where Departments of Unesco other than that of Natural Sciences would be concerned these have been informed. The subjects touched upon in this way include AGRICULTURE, CINEMATOGRAPHY, DEMOGRAPHY, ELECTROTECHNOLOGY, GEOGRAPHY, HYDRAULIC POWER, IRRIGATION AND DRAINAGE, PSYCHIATRY, SEISMOLOGY, SURVEYING.

5. Difficulties of existing situation

Whilst it may occasion surprise that as many as 1,100 multilingual special dictionaries have been published, it should be noted that a large proportion are marked in the Bibliography as being out of print and that they vary as randomly in up-to-dateness, quality, mode of arrangement, convenience of use and present availability as they do in their coverage of languages and subjects. Oriental languages, (which are increasing in importance) and the less used European languages are inadequately covered, and for highly specialized branches of subjects scarcely at all.

Furthermore, all but a handful of the existing dictionaries are the work of individual authors commissioned by commercial publishers. Their reliability depends therefore on the personal judgment of these compilers, the soundness of which the ordinary user has no means of judging. Another objection to leaving dictionary production to unaided commercial enterprise is that the rarer the language or the more highly specialized the terminology it contains the fewer the copies that can be sold and, therefore, the smaller the likelihood of such works being made available, however badly they may be needed by a few people. Under present conditions it is not commercially possible even for such widely recognized productions as the Schloemann series (in six languages) and Pitman's "Technical Dictionary of Engineering and Industrial Science" (in seven languages) to be brought up to date and republished.

An altogether new approach is therefore imperative.

6. Principles proposed

The principles advocated in the Report, developed and improved by subsequent discussion, have now assumed the following shape; but as here expressed they still represent only the personal views of the author and await official endorsement.

(1) Unesco should not itself produce dictionaries but should help the competent international organization in each subject field to compile those which it considers desirable and to publish ~~them~~ either itself or through commercial publishers.

(2) In very exceptional cases such help might include a subvention towards that part of the cost which the organization concerned cannot meet itself. Funds for this purpose are likely, however, to be very limited, and should any be available it is difficult to think of any unchallengeable objective principle whereby Unesco could decide priorities - how, for instance, to determine whether a dictionary on soil mechanics in Portuguese should come before or after one on bio-chemistry in Icelandic. On these grounds it would seem a better policy for Unesco to confine itself to guaranteeing a return on approved investments in dictionary production and to use its resources for practical experiments, on the lines discussed here in Section 7, with a view to perfecting ways of reducing the cost of compilation and publication in the general interest of all.

(3) A special dictionary is desirable for the use of each profession or branch of a profession which pursues studies, researches and careers distinct from those of others. So as to make such a dictionary self-sufficient, it should embody all the terminology peculiar to that branch and a selection of the terminology appertaining to other branches which affect it. (Thus a dictionary of welding should contain all welding terms and also those electrical and mechanical engineering, metallurgical, chemical, etc. terms which welding engineers use).

(4) In compiling dictionaries each organization should concentrate on its own special terminology and should reprint what it needs from other organizations' specialities with a source number identifying these.

(5) The dictionaries should contain two categories of terms: namely "standardized" terms whose source number is underlined, and "unstandardized" terms whose source number is not underlined.

(6) By "standardized" is meant those terms which are officially recommended by the specialist organization concerned to be used with the meaning and scope indicated in a sketch, definition or illustrative context published therewith. The normal process for the organization concerned to adopt in securing such terms should be for it to prepare sketches or definitions and send these to its subject experts of different mother tongues to connect them with the terms they recommend should be adopted in the latter. If a definition is one which has also been adopted by any national standardizing organization which is a member body of ISO this fact should be marked by an additional symbol.

(7) By "unstandardized" are meant any other terms liable to occur in the literature of the subject, including terms current only in certain localities or regions annotated to that effect, whose use has not been officially recommended. Such terms, to be considered for printing in the dictionaries, may be gathered by comparing the usage obtaining in technical publications (including trade catalogues) in different languages. Technical translators, and others willing to co-operate, may also be invited to send in suggested terms which can be passed to the organization concerned and collected in a fichier as proposed in Section 7 here.

(8) Terms originally published as "unstandardized" may, in later editions of a dictionary, reappear as "standardized" if so processed in the meantime. Thus the proportion of "standardized" terms may gradually be increased in successive editions. As this is possible, as standardization is apt to be a slow process, as the methods proposed in Section 7 will make small editions nearly as economical as large ones, and as the need for dictionaries is very urgent it will be better not to delay publication of a first edition by waiting for standardization.

(9) Dictionaries for more than two or three languages should be divided into a basic volume which gives the equivalent terms in these two or three together with the sketches, definitions or illustrative contexts for the "standardized" terms, and a supplementary volume for each additional language which may be published either at the same time or later.

(10) The basic volume may either be divided into chapters or may have the terminology arranged in a single alphabetical order in a given language. The Universal Decimal Classification may be used, if desired, for arranging the chapters, but not for identifying the concepts to which the individual terms relate, for the purpose of making cross references to them from key indexes in another language. This should be done by the use of plain serial numbers printed after the source numbers suggested in paras. (4) and (5) above. Thus 18-1463 would mean "concept no. 1463 for which standardized terms are given in the dictionary prepared by source 18" and 18-1463 would mean "concept no. 1463 for which unstandardized terms are given in the dictionary prepared by source 18". It is of fundamental importance that the reference number once allotted to a given concept should never be changed, even though the term chosen to denote that concept in any given language may be changed in successive editions. Gaps may be left in the numbering to allow the interpolation of new concepts in later editions.

(11) The supplementary volumes will each relate to one language only and will comprise two sections. One section will give the terms of that language in alphabetical order followed by the reference numbers of the corresponding concepts. The other will be in the order of those numbers with the corresponding terms after them. If, then (supposing these volumes existed), a member of the Indian Forest Service wished to read Finnish forestry literature he need buy only the Finnish and the Hindi volumes of forestry terms (which will be quite small), look up the words he wanted in the alphabetical section of the Finnish volume, note the numbers against them and refer to these numbers in the numerical section of the Hindi volume in order to find their equivalents. This one-language-per-volume system offers the advantage that the users of any language, however rare, can produce locally a supplementary volume of their own if they care to pay for it, which will enable them and others to translate either from or into any other language in the network. (As mentioned on page 18 of the Report, a series of "Polyglot Dictionaries" of "General technical terms" on this system has been produced commercially. The collaborating publishers in seven countries might be willing to publish also specialized dictionaries sponsored by international organizations.)

(12) To prevent needless duplication of work and - what is still more important - to prevent any one organization defining or translating a given concept in conflict with another, a Terminological Bureau should be established for each connected group of subjects such as the engineering sciences, the medical sciences, etc. Such a Bureau might either centralize the work of compilation on behalf of the

member organizations by contract or would receive copies of the definitions and terms they were proposing to put into their dictionaries and, by consolidating these into a single index, be able to draw attention to impending conflicts. (The Union of International Engineering Organizations, however, did not adopt this proposal.) The Bureau would also act as a clearing house for suggestions from outside sources and might award contracts for combing the literature in search of current terminological equivalents.

7. Working methods proposed

The technique here to be explained is meant to increase greatly the speed, accuracy and economy both of compiling and of publishing dictionaries through a special combination of photographic reproduction with offset printing. The achievement of these advantages will fall into two phases:

Firstly, the ordinary procedure for making a dictionary involves everything which eventually appears in it being copied and recopied by hand, by typewriter or by typesetting machine many times over. This is especially true if the work is being done by co-operation between a number of people dispersed in different countries. Every such repetition not only takes time and money but introduces an additional risk of error - a risk unlikely to be underestimated by anyone who has had experience in correcting printer's proofs in languages other than the compositor's own mother tongue.

To eliminate this it can be arranged that every term or definition, at the time it is first proposed for inclusion in a dictionary, shall be typewritten on a slip bearing the reference number of the concept to which the term relates. Special diacritical signs and Chinese or other scripts which cannot conveniently be typewritten may be written on the slips by hand. The terms so recorded will be checked for accuracy once and for all and (unless of course another term is decided upon instead) will never have to be copied again by hand either for making up lists for editorial purposes or for finally printing the dictionary with its contents made up in page form. All that will be done, in less time, by photography.

In the actual production a further great saving in time and expense can be secured by the use of photo offset printing. For the limited size of editions which special dictionaries demand (see (8) on page 5 above) this is much cheaper than printing from set type provided a perfect typewritten copy already exists. Furthermore it offers the immense advantage, in application to difficult foreign languages or peculiar alphabets, that the printer cannot make mistakes so no proof correction is involved.

An ordinary typewriter can be used but the best appearance is obtained with one which makes letters of varying widths (the m wider than the i) like a printer's fount. The IBM electromatic typewriter which does this costs around \$800 and the Varityper which has the additional advantage that any number of different styles and foreign alphabets are available which can be interchanged in a few seconds costs about \$2,000. The author is now awaiting delivery of an IBM typewriter with a keyboard specially designed to include the diacritical signs occurring in any language whatever that uses the Latin Alphabet. The appearance of

work typed on foolscap-sized sheets with an IBM machine and reduced photographically by 25 percent may be judged in the Report and Bibliography aforementioned. The typing of these was done in the author's own office; it could have been improved, had he known, by getting the machine adjusted so as not to make such a heavy full stop. The typewritten sheets were sent to a contractor who did the rest at a cost in French francs equivalent to:

\$274 for 1,000 copies of the Report of 34 pages (about 0.80 cent per copy per page)

\$660 for 2,000 copies of the Bibliography of 223 pages (about 0.14 cent per copy per page)

these costs being inclusive of the cover and stitching. (April 1951)

The crux of applying this technique is how to photograph in page form the terms and reference numbers which have each been typewritten on a separate slip. Two ways of doing so have been devised and both of them tried in preliminary experiments. These show either method to be practicable, but further experiments will be needed to find out which is the better and to ensure the requisite standard of reproduction.

The first method would be to use the form of card or slip illustrated and explained in Annex D, except that it would be better to put the reference number in the right-hand instead of the left-hand top corner of the respective spaces, after the language symbols thus: En 8-1683. (It is important these symbols and numbers should always be reproduced with the terms themselves so that any error in the juxtaposition of different languages is at once apparent.)

To obtain a list of say the English terms in alphabetical order in page form, the slips containing these terms are "shingled" (overlapped) upon one another in that sequence so that everything but the top inch of each slip is covered over by the next. The English terms are then photographed, by the reflex contact method, in the form of a strip having the same height as a foolscap page. Such strips of the corresponding terms in any two languages juxtaposed can be rephotographed to produce a bilingual dictionary.

The other method is illustrated on the last page of the present note. The terms in the various languages are typewritten on transparent paper and a carbon copy, also on such paper, is made at the same time and filed together with the original. (The two copies may be accompanied by another slip containing the terms in additional languages, or a definition or illustration drawn in Indian ink.) If it is required to produce, say, a dictionary from Spanish into French, the two copies of the same slip are placed side by side in a cardboard frame cut as here shown so as to align these two languages with one another over an apparatus which makes contact photo-copies by transmitted light with an exposure of five seconds. The two slips are covered over with a mask pierced by a rectangular opening whose position is indicated by the heavy line in the sketch. A sheet of sensitized paper is laid face downward with its top edge just above the rectangular opening and the first pair of terms are photographed onto it. This pair of terms is then replaced by the next which is photographed in the next space below on the sensitized paper, and so on to the bottom of the page.

Whichever of these methods is adopted, the slips will be filed in numerical order. In order to be able to pick them out for reproduction in the alphabetical order of any given language it is necessary to have an alphabetical key in each language even before the dictionary is completed. This can be made, when typing the slips themselves, by taking an additional carbon copy on a sheet of gummed paper which has perforations for tearing the languages apart. The terms in each language can thus be gummed into a separate book in alphabetical order. The terms in these should be widely spaced at first, and the books should be loose-leaf, so that additional sheets can be added when any page becomes too crowded.

8. Related further plans

As complements to the Report and the Bibliography of interlingual dictionaries already published, the following are now projected under the programme:

(1) A bibliography of single language glossaries containing definitions of scientific and technical terms arranged in similar fashion to the bibliography mentioned above. These will include national standards and should be a logical step towards interlingual standardization.

(2) A report on the subject of scientific translation needing combined technical and linguistic knowledge. This will survey the whole complex of problems involved in enabling scientists to exploit knowledge published in languages they cannot read themselves, including the supply and demand and the qualifications and training of translators, the procedures adopted and the possibilities of team work. Attached to it will be international directories of bureaux and agencies employing or registering such translators and of libraries which file, catalogue and supply copies of unpublished translations.

(3) When methods of making dictionaries have been perfected and stabilized it is intended to publish a manual of procedure.

		CDU	
		De 1-1438	Frikions-spindelpresse (f)
	CDU	El 1-1438	prensa (f) mecánica de balancin de tornillo, accionada a fricción
	De 1-1438	En 1-1438	friction screw press
Frikions-spindelpresse (f)			
	El 1-1438	Fr 1-1438	balancier (m) à vis, commande par friction
prensa (f) mecánica de balancin de tornillo, accionada a fricción			
	En 1-1438	It 1-1438	pressa (f) a bilancieri a vite, comando a frizione
friction screw press			
	Fr 1-1438		
balancier (m) à vis, commande par friction			
	It 1-1438		
pressa (f) a bilancieri a vite, comando a frizione			