

**INTERNATIONAL  
LANGUAGE  
AND SCIENCE**

**Louis Couturat**

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## PREFACE

The question of a so-called world-language, or better expressed, an international auxiliary language, was during the now past Volapük period, and is still in the present Esperanto movement, so much in the hands of Utopians, fanatics and enthusiasts, that it is difficult to form an unbiassed opinion concerning it, although a good idea lies at its basis. Both the Volapükists and Esperantists confused the linguistic aspect of the question with so many side issues that, not only was it difficult to see the former in its true light, but also the leaders of the various movements were unable to guide them in the right direction. For this reason discussions concerning an international auxiliary language appeared with good reason to many people to be unpractical, impossible, or indeed even ridiculous. Matters have, however, changed since the *Délégation pour l'adoption d'une langue auxiliaire internationale* has taken the matter up. This International Commission, with its headquarters in Paris, and consisting of literary and scientific men of eminent reputation, was entrusted with the task of investigating the general question of an international auxiliary language. The Delegation has, in the course of an activity extending over seven years, succeeded in showing that a sound idea lies at the root of the various movements for a universal language. Freed from all extraneous considerations, this idea involves the purely linguistic question of the introduction of an international auxiliary language. On the other hand, the Delegation has found that neither Volapük nor Esperanto have succeeded in solving the problem. As, however, Esperanto was found to contain a number of good[[vi](#)] principles, the Commission finally resolved to work out on purely scientific principles an international auxiliary language on the basis of Esperanto. The whole question of the introduction of an international auxiliary language has thus arrived at a stage in which it appears worthy of serious discussion. Under these circumstances,

the writers of this brochure considered it their first duty to draw the attention of scientific and literary men to the matter, and so initiate discussion.

The object of this book will have been attained, should they have succeeded in explaining the present state of the question, and in showing that it is already possible to discuss the introduction of an international auxiliary language into science, and indeed even seriously to make the attempt to carry it out. It may be remarked that the five authors of this book live in five different countries, and belong to three different languages. The very considerable correspondence required for the production of their book was carried out with the greatest success in the *Linguo Internaciona*, whenever any two of the correspondents possessed different mother-tongues.

Paris, Copenhagen, Zürich, Gross-Bothen, Graz.

L. COUTURAT, O. JESPERSEN, R. LORENZ,

W. OSTWALD, L. PFAUNDLER.

*March, 1909.*

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## TRANSLATOR'S PREFACE

The scientific attitude of mind is necessarily critical, but never sceptical without proper investigation and knowledge. The Translator hopes, therefore, that English-speaking men of science will not judge the question of international language before they have quietly and dispassionately examined the arguments so ably set forth in the following pages. It is not a question of "another language"; it is a question of the final solution by the

methods of science of one of the greatest of scientific problems.

Internationalisation of thought is the motto of the twentieth century, the device on the banner of progress. Science, the Super-Nation of the world, must lead the way in this as in all other things. Amidst the clangour and the clamour of political and commercial strife, the quiet empire of knowledge grows, noiseless and unseen. Let all those who believe that this peaceful empire is destined to become the controlling force of the world assist in the attunement of its common language.

The Translator wishes to thank his friend and colleague, Professor J. P. Postgate, for having very kindly revised the translation of [Chapters III.](#) and [IV.](#)

F. G. DONNAN.

UNIVERSITY OF LIVERPOOL,

*March, 1910.*

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## INTERNATIONAL LANGUAGE AND SCIENCE

### [CHAPTER I](#)

#### THE NEED FOR A COMMON SCIENTIFIC LANGUAGE

All who are occupied with the reading or writing of scientific literature have assuredly very often felt the want of a common scientific language, and regretted the great loss of time and trouble caused by the multiplicity of languages employed in scientific literature.

The remarkable and regrettable feature of this state of affairs is that we once possessed, and have now lost, such a common language, namely, Latin. Even in the first third of the last century Gauss wrote a portion of his mathematical and physical papers in Latin, and up to the middle of the last century the dissertations of the scientific candidates at the German universities were translated into Latin by their philological colleagues, since the former were no longer sufficiently conversant with that language. The fall of Latin as the language of scholars and men of science could not, however, be prevented, nor does there exist the faintest chance of its ever recovering its lost position. The reasons for this are known to all. The rise and development of science, for the expression of whose ideas the language of Cicero no longer sufficed, the fall of scholasticism, with its Church Latin, the diffusion of knowledge amongst people not possessing a university training, the foundation of technical high schools, and, finally, the growing national[2] sentiment and jealousy of nations who sought to further the spread of their national languages by using them in the works of their scientific men—all this has contributed to displace Latin by the modern national languages. The result is that, instead of one common language for scholars and men of science, we now possess three.

It is required or supposed that every scholar or man of science should know at least German, French, and English. For the majority of German scholars and men of science this may hold good, but in the case of the French it is less true, and in the case of the English least of all. The knowledge of these three languages is, however, no longer sufficient, and that for the following reasons.

In the first place, several other languages must be taken into account, for many Italians write only Italian, many Dutchmen only Dutch, whilst numerous Russians, Poles, Czechs, Hungarians, Scandinavians, and Spaniards employ only their national languages. In this way much

escapes general knowledge and recognition, or is only accessible in a belated or mutilated form.

In the second place, the difficulty of a quick mutual understanding is great, even for those who can command these three chief languages. If one is possessed of a little natural talent, one can by dint of industry and much loss of time easily get so far as to read or understand a paper or a letter in a foreign language, but when it comes to writing (replying) the task is incomparably more difficult. One can, however, not assume, when a German scholar or man of science replies in German to a letter written in French or English, that he will be always understood.

The matter is much worse in the case of oral intercourse, especially at scientific congresses. At these the three chief languages mentioned above are usually now declared to be official, that is to say, permissible for the delivery of papers. As a matter of fact, however, the language of the country in[3] which the congress is held usually dominates. The German speaks French in Paris, but the Englishman mostly only English, and demands, as occurred at the recent Refrigeration Congress in Paris, the translation into English of the papers read at the sectional meetings. Only very few can take part in the discussions, and many must be well content if they are able to understand the usually rapidly delivered papers. Many an important criticism is not made because one does not possess the expertness necessary for discussing a question in a foreign language, and does not wish to expose oneself to the chance of a rebuff, caused not so much by ignorance of the matter in hand as by want of facility in expression.

Every member of a congress has noticed that whenever the language employed in the papers changes, a considerable number of the audience leave with more or less noise, in order to avoid being compelled to listen to a paper which they do not understand. Congresses would be

certainly much better attended were it not that these difficulties keep many away.

One cannot hope that an increasing diffusion of the knowledge of the three chief languages will cause these difficulties to diminish, still less to disappear. They will, rather, increase still more, since the number of national languages desiring to take part in the work of civilisation is constantly growing. Already, at the present time, Italian, Spanish, Dutch, and the Scandinavian and Slavonic languages must be taken into account, besides the three chief languages. National sentiment forces the scientific men of these countries to use the national languages, even when they perceive that this procedure does not conduce to mutual understanding. Even if the scientific men themselves were completely free from national *amour propre*, they would be obliged by their fellow-countrymen to employ their own languages, not so much for the purpose of advancing scientific knowledge and learning as in order to contribute<sup>[4]</sup> by means of their literary and scientific works to the diffusion of their languages and the advancement of their nations. Whoever has observed this phenomenon will be forced to the conclusion that amongst scientific men, at least in Europe, this state of affairs is getting worse rather than better.

The increase of the participating languages involves an increase of the periodicals, just at a time when a concentration of the periodical literature is most desirable. The cost of subscriptions, translations, storing, and registration, and the labour and time spent thereon, increase from year to year. Above all, there is a want of translators; ordinary interpreters are not sufficient, since a special knowledge of each subject is required. Where are such persons to be found in sufficient numbers? And how few and far between are those who, when they possess the requisite training, are willing to content themselves with the poorly paid remuneration of a translator!



Bad or erroneous translations and faulty abstracts are very harmful; it would be better in such cases that no translation should exist, as then the original would have to be consulted. These difficulties, many more of which could be mentioned, are well known to all scientific men, since each has suffered more or less from them.

The question then is, What remedy can we apply? One proposal is to introduce into secondary schools the teaching of modern instead of classical languages, in order to render the students, after matriculation at the universities, capable of taking part in international scientific intercourse. This proposal has arisen from the view that the learning of modern *added* to that of the classical languages would overburden the secondary schools, whilst the learning of modern languages at the universities would cause equal or greater difficulties.

Few young people possess, during their years at the[5] university, sufficient keenness and moral courage to subject themselves to the ordeal of linguistic studies, from which they have joyfully escaped on their entrance into the university. Few possess at that age a full conception of the usefulness and necessity of a knowledge of languages. And it is just those young people who wish to devote themselves to the professions of literature or science who ought to devote their whole time and full powers to their professional work, and not be obliged to break up their time with linguistic studies.

The proposal to exclude the classical languages from the secondary schools has encountered, however, from many quarters very weighty objections, the force of which cannot be denied, even by the opposite side. We shall, however, not enter into this much-debated question, contenting ourselves with the remark that at the present day insuperable obstacles stand in the way of a complete or partial substitution of modern for classical languages. Experience shows also that the teaching of modern

languages in schools seldom leads to a practical result, although it must be conceded that nowadays, with newer methods, much better results are obtained than formerly, when the grammar, but not the practical use, was taught. If, therefore, the teaching of modern languages cannot well be carried out either at the universities or in the schools, there remains only the time before school studies. It is, in fact, possible (as is done in many well-to-do families), by means of a French or German governess, to teach a child, besides its mother tongue, one of these languages, in so far as its mental development permits. It is probably inadvisable to teach more than one new language in this way, in order to avoid injury to the child's own mother tongue. Such a knowledge, however, is quite insufficient for the needs of the young scientific man, and so the acquaintance with a language gained in this way requires constant extension and development.

[6]

But even assuming that the young man continues the study of the language that he has learnt as a child, or even indeed learns another during his school days, he will possess at best that approximate knowledge of the three chief languages which we have characterised above as being neither qualitatively nor quantitatively sufficient, because it does not suffice for oral intercourse, and because other languages must be taken into account.

The proposal has, therefore, been made to choose, by international agreement, *one* of the national languages as a universal *intermediary* language. If everybody learnt this language, then the difficulty would be surmounted.

This proposal is, however, still-born. Every attempt to realise it is bound to be shipwrecked on the rock of national jealousy, as has been often shown before, for it is evident that the nation whose language was chosen would receive a very great advantage. The widely spoken English language possesses, it is true, a very simple grammar, but

it would be very unsuitable for this purpose on account of its extremely difficult pronunciation.

Just as science has succeeded in giving to the world a uniform system of weights and measures by choosing instead of a national unit of length one common to all nations, namely, the length of an earth quadrant, so only that language could find general acceptance which was based on the common possession of those peoples for whom it was intended. By that we mean the stock of words common to the three great families of languages, the Germanic, Romance, and Slavonic.

Against this the objection will be raised: "An artificial language; in other words, a Utopia! How could one think of artificially creating a language, which, after all, is a living and spontaneously developing organism? One might as well think of artificially creating a live horse!"

It is true that one cannot make a live horse, but one can<sup>[7]</sup> make an automobile, which under certain circumstances may replace the horse, and even excel its performance. But no one would think on that account of totally doing away with horses. In a similar manner the partisans of an artificial language have no wish to displace the natural languages. In poetry and imaginative literature, wherein the soul of a nation finds its highest expression, the mother-tongue will always be supreme.<sup>[1]</sup>

"But it is unthinkable," one will say, "that an artificial language would ever be generally accepted."

Such statements must be received with caution, for they have turned out more than once to be wrong. The introduction of a common system of weights and measures was also declared to be impossible at one time, nevertheless it has since been carried out in science. The construction of a system of telegraph wires connecting the whole civilised world and a telegraph alphabet common to

all nations was declared seventy years ago to be an impossibility. Now it is ancient history.

The maritime nations have agreed upon a common code of signals. When the English sailor arrives at the Japanese coast, he translates the sentences he wishes to transmit into numbers, which he signals by means of flags, and the Japanese port official translates the signalled numbers by means of the code into Japanese sentences. Why should it therefore be impossible to introduce instead of this intermediary *numerical* language an intermediary *word* language, which would give expression to thought in a better and more direct manner?<sup>[2]</sup>

"Quite so, but such an intermediary language would be much more difficult to create than a code of signals arranged for a limited number of words and phrases."

[8]

How would it be if this difficulty had been already overcome, and the intermediary language already created and proved to be serviceable?

"But that would amount to adding a new language to be learnt to the ones we already have to learn; there would be no advantage in that!"

If, however, this "new" language was really not "new," consisting mostly of words known to every educated person; if its grammar was so simple that its principles could be learned within an hour; and if, therefore, any educated person who knew a single Romance language could learn the whole language in an incredibly short time, would it not be an advantage to acquire it?

To prove this is a simple problem of permutations and combinations, and the proof possesses all the certainty of mathematical reasoning. We shall demonstrate that by an example.

Suppose a large town contains ten districts, each possessing a pneumatic post-office. In order to connect each district with all the others, one could lay from each of the ten post-offices nine tubes to the remaining nine post-offices. That would require  $(10 \times 9)2 = 45$  tubes. The problem could, however, be solved much more easily and cheaply by connecting each of the post-offices by means of a single tube with a central post-office, which would receive and distribute all the letters, as is actually the case in practice. We should then require only ten tubes.

Substitute now for the districts imagined above the languages, German, French, English, Italian, Russian, Spanish, etc., with the condition that every person speaking one language should be able to correspond with everybody speaking a different language. In the case of ten languages we should require for every correspondent nine dictionaries, or altogether ninety dictionaries.

[9]

Every correspondent would have to know nine languages besides his own. If, however, we employed an intermediary language, each person would only require to know this language besides his own. The matter is so simple and the advantage so exceedingly obvious that one can only wonder why it has not been recognised and carried out long ago.

It is quite self-evident that, if one wishes to become acquainted with the imaginative literature and the inner thoughts and feelings of a foreign nation, one cannot content oneself with translations, but must study a language in its own country. But how many people learn French in order to become acquainted with its literature? The existence of an intermediary language would interfere with such linguistic studies just as little as the invention of the automobile prevents anybody from using a riding or carriage horse. There is no necessity, therefore, for philologists or professional linguists to be hostile to the

project, since their sphere of work and influence will not be in any way diminished thereby. On the contrary, the creation of an artificial language has led to so many interesting questions relating to the structure, and to such a deeper insight into the nature of language, and has attracted so many to its study, that this beautiful department of knowledge will only derive advantage therefrom.

It is also remarkable that the original work of Dr. Zamenhof, which in its principles was characterised by genius, but in its execution was imperfect and therefore insufficient, has only through the reforming labours of distinguished philologists attained to that perfection of form and principle required to make it the international auxiliary language of the civilised world. The difficulty of the undertaking no longer lies in the language itself, but, rather, in the task of inspiring all concerned, and especially the leading thinkers, with the conviction that it is practically realisable. If this conviction can be sufficiently spread, the introduction of the [10] auxiliary language will only be a matter of a few months. In order, however, to form an opinion on the possibility of this realisation, it is, in the first place, necessary to become acquainted with the main principles, structure, and origin of the language which we recommend.

L. PFAUNDLER.

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[11]

## CHAPTER II

*THE "DÉLÉGATION POUR L'ADOPTION D'UNE  
LANGUE AUXILIAIRE INTERNATIONALE"*

One of the most important problems of present day civilisation is the introduction of an international auxiliary language.

We boast of our international intercourse. The civilised world has extended to new nations and has embraced whole regions of the earth, and yet, in spite of the magnificent means of material communication, nothing of a similar nature has been done for the purpose of uniting minds together in an equally practical manner. Recently, however, an event has occurred at Paris which brings us a step further in this direction. The *Délégation pour l'Adoption d'une Langue Auxiliaire Internationale*, which was formed in 1900 as a result of the Paris Exhibition, has, after an activity of seven years, arrived at a definite decision.

The very fact that modern international relations have brought about such a delegation and entrusted it with work should be sufficient to emphasise the importance of the problem. It is not true that the need for an international auxiliary language disappears with the knowledge of several national languages, as has been asserted by many who, on account of their personal knowledge, have not experienced it. This is especially true of some philologists who overlook the fact that languages form the object of their special studies, and draw conclusions from themselves concerning the needs of others. Expertness in the use of languages does not come so readily to the scientific investigator and the technologist, whose work lies in other directions, and so it[12] is in these quarters that the movement for the introduction of an international auxiliary language receives the greatest support. To this must be added the fact that, as Ostwald has aptly remarked, the scientific investigator regards language only as a means of making himself understood. Language is *not* for

him something "which thinks and poetises," but rather an instrument for conveying his knowledge and wishes to other people, much after the fashion whereby the musician is enabled to convey his feelings by means of musical notation and the instruments of the orchestra. The question of the suitability of a language is important in this connection; and so it does not appear so very strange that it is just the scientific investigators, technologists, and philosophers who have never been quite satisfied with living or dead languages. How otherwise can we explain the fact that it is just they who are constantly solving philological problems and constantly occupied with the invention not only of new signs and symbols (mathematical, chemical, crystallographic), but also new words? The fact is that science, philosophy, and technology are constantly waging a fierce battle with existing languages. What they want is a language as simple and clear as the fundamental laws of nature, as logical as the precision of experiment, and as many-sided as the complexity of the facts which it has to describe. And so they are constantly working at the creation of this language, all the words invented by science finding their way unceasingly through the channels of technology into the general vocabulary. These words possess the special property of being international, that is to say, understood by all civilised nations, including the Japanese. We do not wish, however, to stop at this stage of development; we wish to be able to internationalise not only single ideas, but also the whole train of thought. For this purpose it is impracticable to make use of any of the national languages, since they are all[13] so unsuitable, illogical, capricious, and complicated that the student must learn to steer clear of thousands of difficulties before he is able to express himself fairly correctly. *It is possible to construct an artificial language with such a regular structure that it can be employed at once without making mistakes.*



In accordance with these ideas, the programme of the Delegation was as follows:—

"(1) It is desirable that an international auxiliary language should be introduced which, though not intended to replace the natural languages in the internal life of nations, should be adapted to written and oral intercourse between persons of different mother-tongues.

"(2) Such an international language must, in order to fulfil its object, satisfy the following conditions:—

"(a) It must be capable of serving the needs of science as well as those of daily life, commerce, and general intercourse.

"(b) It must be capable of being easily learnt by all persons of average elementary education, especially those belonging to the civilised nations of Europe.

"(c) It must not be any one of the living national languages.

"(3) The decision as to the choice of a language is to be referred in the first place to the International Association of Academies, but if the latter should refuse to consider the matter or come to no decision, to the committee of the Delegation.

"(4) Circulars are to be sent to learned, commercial, and legal societies requesting them to signify their approval of the above programme."

The success of this appeal was extraordinary. It was now evident for the first time how many thousands of people of all nations were enthusiastically in favour of the introduction of an international auxiliary language. The<sup>[14]</sup> *État de la Délégation*, which the latter published yearly, included on October 1st, 1907, in the list of corporate bodies alone, the names of 310 clubs, societies, and congresses, not a few of which possessed a membership exceeding 1,000. It is interesting to rapidly

pass in review the extremely varied character of the societies included therein. We find, for example, commercial schools, chambers of commerce, merchants' clubs, stenographers, the printing trade, correspondence bureaus, photographic clubs, associations of municipal and other officials, societies of shipping employés, legal clubs, pedagogic and religious societies, officers' clubs, institutes for the deaf and dumb and for the blind, sociological, medical, and health societies, peace clubs, political and graphological societies, touring, bicycle, and automobile clubs, sport clubs, bibliographic societies and library staffs, and finally all sorts of special scientific societies and congresses. Arranged according to nationality, we find representatives of France, England, Germany, Switzerland, Denmark, Spain, Greece, Italy, Belgium, Norway, Sweden, Holland, Russia (including Poland), Roumania, Austria (including Bohemia and Hungary), Mexico, Peru, the Argentine, Algeria, Tunis, the United [States](#), [Chile](#), etc. There is also the "academic list," which contains the names of no less than 1,250 professors, belonging to 189 universities, technical high schools, and academies of science, and coming from 110 parts of the globe, extending as far as India and Japan. It may be stated without exaggeration that the programme of the Delegation found an enthusiastic response in all parts of the world and from people of nearly every occupation and profession, many persons and societies expressing themselves in favour of the introduction of an international auxiliary language on the condition that it should not be one of the living languages.

During the seven years of its existence the Delegation[15] has carried out the duties entrusted to it in an exemplary manner, and has performed a gigantic amount of work. In May, 1907, the Delegation considered the time had come to lay the matter before the International Association of Academies. At that time the report was very wide-spread that the Association had altogether refused to

consider the matter. In reality the Vienna Academy, as President of that year, decided to bring the question before the Association, but the latter declined to take the matter up (twelve votes to eight, one member not voting). At this point the Delegation had the right and the duty to speak out. It obtained an expression of opinion from the representatives of all the associated societies and clubs. The result of this was the formation of a working committee, consisting of sixteen members, almost entirely scholars and men of science of reputation and members of the different scientific academies. With the representatives of natural science and mathematics were associated philologists and linguists. The committee began to sit on October 15th, 1907, and, after eighteen sittings held in the Collège de France, arrived at a decision.

Before we enter into this matter more fully it will be desirable to give a brief sketch of the historical development of artificial language.

Anyone desiring to go more deeply into the history of this question (already three hundred years old) and the practical attempts at its realisation may be referred to the masterly work of L. Couturat and L. Leau, *Histoire de la Langue Universelle* (Paris, 1903). In what follows only a few of the most important points will be mentioned.

The oldest extant reference to the problem of an international language appears to be contained in the letter written by Descartes on November 20th, 1629, to his friend Mersenne. The great philosopher here explains the principles which convinced him that it would be possible to[16] construct an artificial language which could be used as an international auxiliary language. As for Leibnitz, who was attracted throughout his whole life by this problem, his language projects have been recently investigated by L. Couturat by means of documents, many of which have never before been published (*La Logique de Leibnitz* and *Opuscles et Fragments Inédits de Leibnitz*).

There may further be mentioned the *Ars signorum Vulgo Charakter Universalis et Lingua Philosophica* (London, 1661) of George Dalgarno, and the recently discovered memoir of an unknown author entitled *Carpophorphili Novum inveniendæ Scripturæ Œcumenicæ Consilium* (Leipzig, 1734). The last-mentioned system in particular strikes one as highly modern in principle.

It was only, however, at the end of the last century that the era of practical things began with the Volapük of Schleyer. The success of this language was very considerable. It possessed about thirty journals, published in the most different countries, even in Japan, and its literature has been estimated at from 300 to 400 works. The official lists published in 1889 contained the names of 255 local groups belonging to the "Universal Language Society," some of which possessed a very considerable membership. The teaching of the language was highly organised, there being 900 teachers, 200 head teachers, and 50 "professors." This great linguistic experiment was very instructive, and its significance cannot be underrated. Important conclusions concerning the theory and practice of artificial language can be drawn from it, and especially from a consideration of the circumstances which finally led to the downfall of Volapük. It turned out that this was due to the errors which Volapük itself contained, showing us that in these matters, as in others, practical experience is the best teacher. The fate of Volapük was sealed when its supporters, in the year 1889, made the experiment of organising<sup>[17]</sup> a congress at which Volapük should be spoken. Although a few Volapükists succeeded in speaking the language, it was only too painfully evident that such a goal could not be reached with this system. Almost simultaneously with Volapük another artificial language had been invented. The Russian medical man Dr. Zamenhof published his system in 1887 under the pseudonym of "Doktoro Esperanto." But as Esperanto arrived while Volapük was at its zenith, it failed at first to

attract general attention. It found, however, in France, an enthusiastic supporter in the Marquis de Beaufront, who had himself worked out an international language called "Adjuvanto." He gave this up as soon as he came to know about Esperanto, and founded the *Société Française pour la Propagation de l'Esperanto* and the journal *L'Esperantiste* (now in its tenth year). France soon became the centre of the new movement, and indeed almost the whole existence and magnitude of the Esperanto movement was due to the influence of this man. Since then Esperanto has extended to all countries. The Esperanto journals appear mostly in a bilingual form, the number of them being, as in the Volapük movement, about forty-five, whilst there exist a few journals and periodicals published exclusively in Esperanto. A special significance attaches to the international congresses organised by the Esperantists, at which only Esperanto is spoken. In 1905, at Boulogne-sur-Mer, there assembled 600 members, belonging to about fifteen different nationalities. The differences of pronunciation which, on account of certain peculiarities of construction in Esperanto, must necessarily appear amongst the Romance nationalities and the English, were not, we are told, sufficiently marked to prevent mutual comprehension. The second congress took place at Geneva in 1906. At the third congress, in Cambridge, in 1907, there were present about 1,400 members, whilst at the fourth congress, in Dresden, in 1908, there assembled also 1,400[18] members. Whatever opinion one may hold about these congresses, at which much confusion and misunderstanding, and indeed even much that was ridiculous, took place, they represent, without doubt, a great and remarkable philological experiment, and one which demonstrates the possibility of synthetically constructing a language that can be spoken. On the other hand, however, the Esperanto congresses showed, according to the concordant testimony of all persons of unbiassed opinion, that the Esperanto language in no wise represents the final solution of the problem. All

farsighted leaders of the Esperanto movement have been for a long time the more fully conscious of this state of affairs the more profound their knowledge of the Esperanto language. Chief amongst them may be mentioned M. de Beaufront himself, who has come forward as one of the leaders of reform, a reform which in many important respects was recognised as necessary by Dr. Zamenhof himself in a series of interesting memoirs. The recommendations of Dr. Zamenhof were, however, rejected in 1894 by the so-called "Fundamentists" (157 votes to 107), who were supported by a few great publishing firms interested in the preservation of Esperanto. By reason of the fact that the Esperanto alphabet contains no fewer than six special letters to be found in no ordinary printing fount, the firms referred to possess the monopoly of the very considerable trade in this literature. The Fundamentists hold the view that, in spite of a few errors in the auxiliary language, its success can only be assured by absolute conservatism. They have, therefore, declared the grammar, together with the reading book and vocabulary, published by Zamenhof under the title of *Fundamento de Esperanto*, to be sacrosanct, and go so far in this matter as to revere as "correct" and "classical" Esperanto the infringements of his own rules, the grammatical errors, and even the misprints to be found in the *Fundamento*.

[19]

The idea of a powerful organisation has undoubtedly at first sight something very attractive about it. One must, however, not forget, even in the case of an international language, that no organisation in the world can arrest the progress of a necessary development. Every human contrivance and invention is subject to change, errors and deficiencies being corrected. Especially is a rational development inevitable in the case of things, such as an international language, which are subject to the control of our intelligence. Conversely it is not difficult to reply to

the question, How is it then possible, when a system has once been chosen, to carry it out and preserve it? For there are two fundamental qualities which, happily for us, are apparent in the history of inventions, and each of which confers stability quite apart from any conventions, namely, a high degree of rational development based on the most profound knowledge and an extraordinary empirical perfection. As examples of the latter may be mentioned the notation of music, which since Guido d'Arezzo (born in 990), or at any rate since Johann Sebastian Bach, has not appreciably changed; the division of time into twenty-four hours and of the hour into sixty minutes, which is at least three hundred years old; the face, mechanism, and hands of a watch, which date, with unimportant changes, from the Renaissance; and, finally, the violin, which retains up to the present day the characteristic form which the ancient Italians gave it. Is it not wonderful that this strangely carved piece of wood must possess just that particular form in order to yield its harmonious tones?

As examples of the former may be quoted almost all modern achievements. The metric and decimal systems have come to stay. The bicycle, the motor car, and the typewriting machine have undergone successive improvements till finally they have attained to their more or less definite form. We see from this that when inventions have[20] once reached a certain degree of suitability they are not afterwards easily replaced by others. There is, therefore, only one adequate criterion of the stability of an international language, namely, that of suitability or adaptation to its purpose, and we maintain that it is only by means of continuous reforms and improvements that it will succeed in satisfying this criterion and so finally attain to stability. In the work of Couturat and Leau, referred to above, there are described about ten artificial languages which have sprung up during and after the period of Volapük and Esperanto, and in which the experience of their predecessors has been more

or less made use of. A study of these attempts leads to the surprising result that they often differ amongst themselves less than, for example, the Romance languages. If, then, one were to choose any one of these languages and to direct its systematic development according to the principles which experience and knowledge have shown to be requisite for the construction of an international language, one would in each case arrive finally at approximately the same result.

At the present day the rapid development in every department of life has made us only too ready to regard everything around us as transient. We forget, however, that the rapidly accumulating inventions and discoveries which startle and surprise us always refer to new things. One must bear in mind that there also exist things which in their essential features can *only be invented once*, and that the international language in its final form is one of these.

An excellent means of convincing the incredulous is to demonstrate the absence of arbitrariness in the character of an invention or improvement, and the degree of general consent which a given system has already obtained. Whenever one has recognised the natural and logical basis of a discovery one perceives relationships which restrict the [21] ideas of chance and haphazard originally associated with it in one's mind. It is, therefore, quite unnecessary in the case of an international language to be afraid of "the arbitrary action of private persons who possess neither the right nor the authority to introduce reforms into Esperanto," as Dr. Zamenhof has recently stated. One ought rather to feel sure that the best means of defending an international language against arbitrary changes is the degree of its concordance with sound theoretical principles.

Wilhelm Ostwald has given us an account of the work of the Delegation. The commission consisted of representatives of the English, German, Italian,



Scandinavian, and Slavonic languages. Famous philologists such as Otto Jespersen, of Copenhagen, and Baudouin de Courtenay, of St. Petersburg, as well as the philosopher L. Couturat, of Paris, rendered priceless services. The proceedings, which were held in the Collège de France, began with the interviewing of a number of the inventors of artificial languages or their representatives, all such people having been invited to the conference. Where this procedure was not possible the corresponding writings and documents were examined and discussed. Concerning this work Ostwald writes, "Although these labours were very fatiguing, they proved all the more effective for the progressive elucidation of the problem in hand. From the very multiplicity of the attempts at a solution and their discussion there arose in the minds of the workers, in a manner never to be forgotten, a clear conception of the main conditions required for a successful solution of the problem, and a recognition of the errors which a disregard of one or other of these conditions had produced in the existing systems." Whilst an account of the nature of these principles and of their application to the construction of an international auxiliary language will be given by competent authorities in the following chapters, we may here mention that the Delegation decided that none of [22] the existing systems satisfied the conditions necessary for an international auxiliary language, but that the widely known Esperanto could serve as a basis for the working out of such a language, although it would require to undergo a certain number of changes.

A standing committee was elected, including Ostwald, Couturat, De Beaufront, and Jespersen, which was entrusted with the task of determining the new forms of the international auxiliary language on the basis of the principles laid down in the sittings mentioned above.

The changes carried out by the committee of the Delegation are embodied in the form of new grammars and dictionaries. The Delegation succeeded not only in

recognising, but also in correcting in a competent manner, the errors of Esperanto, with the result that we are to-day in possession of a language which in respect of facility, lucidity, variety, and elegance of expression, represents the high-water mark of international speech.

The success which this reform achieved amongst the public and also in Esperantist circles immediately after the publication by the Delegation of the first specimen of the new language was astonishing. That which the Esperantists had scarcely succeeded in doing during six years of their existence took place with astonishing rapidity before our eyes, and in scarcely as many months there were formed in sixty towns of Europe and America local groups of enthusiastic people affiliated to the Delegation.

Unfortunately the Fundamentalists persist in their obstinacy and continue to manifest their discontent. Although the new language has sprung from Esperanto and is based upon it, the Esperantists have forbidden that the name Esperanto should be used. The conventional name *Ido* (*i.e.*, a descendant) has therefore been given to it. There exist already some periodicals in the *linguo internaciona*. The chief organ of the new movement is the periodical<sup>[23]</sup> *Progreso* (pronounced *Progresso*), "*oficiala organo di la Delegitaro por adopto di linguo helpanta internaciona.*" It is edited by Professor L. Couturat in Paris, and owes its name, programme, and policy to the advice and initiative of Ostwald.

The superiority of *Ido* over Esperanto is so striking and is so incontestably borne out by practical experience that one can now really speak, after the Volapük and Esperanto periods, of a third world-language movement which has started off with a reaction-velocity hitherto unknown in this department of knowledge. It is characteristic of the new language that it has been taken up by the English and Americans, whilst an introduction of primitive Esperanto

amongst the Anglo-Saxons encountered insuperable obstacles, for, as was pointed out with good reason, the English language, especially in regard to its grammar, was superior to Esperanto on account of a number of clumsy constructions and errors which the latter contained. But, apart from the regularity of pronunciation, Ido excels the English language both in regard to grammar and, what is of great importance, brevity, a printed Ido text being even briefer than the corresponding English one.

For the benefit of those who are unacquainted with the nature of international language and who still regard an artificial language as an impossible monstrosity, we may remark that the new vocabulary contains in round numbers 5,400 stems, and that, in spite of the Romance character which the international language necessarily possesses, 40 per cent. of these are common to the following six languages: German, English, French, Italian, Russian, Spanish (and to many others). Moreover, there are naturally innumerable other stems which occur simultaneously in five or four of the great languages. In the face of this overwhelming evidence, no one can contest the possibility of an international language, for the above[24] numbers tell their tale with unmistakable clearness. They *prove the existence of the international language apart from every theory*. It is only necessary to select judiciously the words common to the living languages, that is to say, by an artificial process, in order to construct the international language.

Besides the purely linguistic standpoint, the Delegation considered the whole question of an international auxiliary language from another and an essential point of view. It is natural, and sufficiently well known, that in both the Volapük and Esperanto movements the linguistic issue was mixed up with a large amount of disorder, error, misunderstanding, and illusion. This was due to the fact that these movements were largely directed by scientifically untrained persons, and partly also fell into

the hands of fanatics and Utopians. Added to this was the desire to soar to the summits of literature instead of confining themselves to practical matters, and the truly childish confidence which led them to spoil the classics of different nations by translating them into a language intended for other purposes. This latter trait was even more markedly pronounced in the Esperanto than in the Volapük movement. The Delegation, as a commission of serious men of science, has steadily laboured to free the question from all extraneous considerations, of which we have mentioned only the best known, and the standpoint which is taken in the periodical *Progreso* is in all respects a serious and scientific one. In this way it has been possible to attain finally to a stage at which the whole question can be discussed on its merits. The action of the Delegation marks, therefore, without doubt the beginning of a rational period in the history of the movement for a universal language. Henceforth he who comes to mock will have nothing to say, and the sceptic will have to search for serious and competent reasons if he wishes to maintain his case.

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The point of view which the Delegation has taken is that the solution of the problem of an international auxiliary language is a purely scientific and technical question. Scientific in a double sense of the word: in the first place, because the living germ of an international language is already to be found in science and as an expression of the civilisation of Europe and America, requiring only an artificial development to bring it to maturity and to give us the international auxiliary language in its final form; in the second place, because the method of artificial development of the international language forms itself the object of a science, and that indeed a new one, namely, the philology of auxiliary language. The question is also a technical one because the result obtained by theory is destined for a practical purpose, namely, the daily use of

mankind. Our modern civilisation is signalised by the application of science to practice. We are no longer pure empiricists. Science penetrates into every department of daily life, and all enlightened people are aware that the age of pure empiricism is over.

The movement for a universal language possesses its epochs, like other things, but we may rest assured that the era of the attempts to solve the problem of auxiliary language in a purely empirical, or even indeed romantic, manner has passed away with the Volapük and Esperanto periods.

The work of the Delegation has also been in a high degree an organising one. The beginning of the year 1909 gave birth to a *Unione di l'Amiki di la Linguo Internaciona*, extending over all parts of the world. From this union are derived by election two directing bodies: firstly, the *Komitato*, a commission which looks after matters of organisation and business; and secondly, an *Academy*, entrusted with the scientific investigation of the international auxiliary language, which sees to its steady progress, corrects the errors and deficiencies which are sure to make their appearance, decides<sup>[26]</sup> in doubtful cases, and regulates the introduction of new words and constructions.

The carrying out of this scientific and technical programme has now become the duty of all who feel the necessity for an international means of communicating thought.

RICHARD LORENZ.

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## CHAPTER III

### THE LINGUISTIC PRINCIPLES NECESSARY FOR THE CONSTRUCTION OF AN INTERNATIONAL AUXILIARY LANGUAGE, WITH APPENDIX: CRITICISM OF ESPERANTO

There exist more than sixty systems or attempts at an artificial universal language, and considering the great diversity of these languages, it might appear hopeless to arrive at unanimity concerning any one of them. When, however, one considers the question more closely, it appears that matters are not so bad as one might imagine. Whereas twenty years ago the systems which appeared were as different as day from night, at the present day one perceives great lines of convergence, pointing to the time when mankind shall have added to the other triumphs of civilisation that of an auxiliary language recognised and used by everybody, to the great advantage of all whose horizon is not limited by the boundaries of their mother country.

Is it possible in a single formula to express everything that is requisite for a practical international language? I think so, and a brief consideration of the two reasons which prevent us from choosing one of the natural languages as an international language will enable me to arrive very quickly at this formula. The first reason is, that such a procedure would unfairly benefit one nation at the expense of all the others and would infringe the fundamental principle of neutrality, which is necessary in all international affairs. The second reason is, that every language is too difficult for foreigners. All existing languages swarm with difficulties of pronunciation, spelling, grammar, vocabulary, and especially idiom. It is very seldom that a foreigner succeeds, even[28] after years of study, in learning a language sufficiently well to avoid occasionally making one of those mistakes which instantly betray his origin to the natives; it may be a false stress, or a word employed with an almost imperceptibly different

shade of meaning, or placed in a position in a sentence where the native would never place it, or, finally, a phrase which, though logically correct, is nevertheless not permitted by the usage of the language. On account of their innumerable relationships and associations, which is indeed what makes them so dear to the nations that employ them, all natural languages are extraordinarily difficult, and therefore unsuitable for the purpose of international intercourse. We require, accordingly, a language which shall be not only neutral, but also as easy as possible: easy to learn, easy to use, and easy to understand.

These considerations bring me to the sought-for formula, which we may express in a form similar to the celebrated ethical dictum of Hutcheson and Bentham ("That action is best which accomplishes the greatest happiness for the greatest number"):—

*That international language is best which offers the greatest facility to the greatest number.*

It may be objected, however, that facility is a subjective idea: what is easy for one is not always easy for another. Quite so, and it is exactly that observation which will serve us as a guide in the investigation of the important conclusions which may be drawn from our fundamental principle.

In the first place, as regards the alphabet and the pronunciation, our fundamental principle leads to the choice of the Latin alphabet, with the exclusion of all accented or otherwise specially modified letters; neither *ä, ö, á, à, â, ç*, nor the circumflexed *ê, ê, ĥ, ĵ, ŝ*, especially invented by Dr. Zamenhof for Esperanto, can be tolerated, for they hinder, and sometimes even render impossible, writing, printing, and telegraphing. I have shown in the Introduction[29] to the international dictionaries of De Beaufront and Couturat how our fundamental principle leads to the following alphabet and the following sound values: *a* (as

in *father*), *b*, *c* (like *ts*), *d*, *e* (like *e* in *net* or like *a* in *fate*), *f*, *g* (always hard, as in *go*), *h*, *i* (like *ee* in *sweet*), *j* (either like E.<sup>[3]</sup> or like F.,<sup>[3]</sup> as in *journal*), *k*, *l*, *m*, *n*, *o* (as in *go* or as in *not*), *p*, *q* (*qu*, as in G. or as in E.), *r*, *s* (always unvoiced), *t*, *u* (always like *oo*, as in *too*), *v*, *x* (as in G. or as in E. F. in the words *exist*, *exister*), *y* (as in E. F., and therefore like G. *j*), *z* (as in E. F., and therefore like the voiced North German *s* in *rose*), further the two double letters *ch* (as in E., for example *church*) and *sh* (as in E., G. *sch*).

The strict phonetic canon "One symbol, one sound," is therefore followed in so far as the same sound is never arbitrarily written one way in one word and another way in another word, and the same letter is never pronounced differently in some words compared with the majority. The small exception that *sh* and *ch* are not equivalent to *s + h* and *c + h* respectively cannot cause the least difficulty to anyone, and the use of *qu* and *x* enables us to retain the international spelling of many words, and, moreover, permits two different pronunciations which cause no difficulty of comprehension and simplify the pronunciation for several nations. Otherwise we should be faced with the difficult problem of choosing between *kwala* and *kvala*, *eksistar* and *egzistar*. It must not be forgotten, too, that for our purposes the purely theoretical canon "One symbol, one sound," must be subordinated to the fundamental principle of greatest facility, of which phonetic simplicity is itself only a consequence. Practical considerations must, in fact, overrule theoretical objections whenever a small deviation from the fundamental principle "One symbol, one sound," produces greater facility.

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There remains to be discussed a matter of very great importance for the phonetics of international language.



Whilst all nations pronounce without difficulty a series of sounds in which the vowels alternate with single consonants, and almost all nations have no objections to certain groups of consonants which are easily pronounced (such as *tr*, *sp*, *bl*, etc.), the pronunciation of other heavier groups, especially at the end of words, presents the greatest difficulty to many nations. The French usually simplify too complicated groups by inserting an unwritten vowel (as, for example, in *Félix(e) Faure*), Italians who speak English do almost the same thing in the case of such groups as *kstr* (*Greek Street*) or *ksp* (*sixpence*), and the phonetic usages of other nations do not permit even as many successive consonants as the Italians. In order to make matters as easy as possible for everybody, one must avoid the mistake of *Neutral Idiom*, many of whose words contained very heavy groups of final consonants, endeavouring rather to follow the example of Esperanto, which succeeded very cleverly by means of its predominance of vowel terminations in producing not only grammatical clearness, but also as easy and flowing a pronunciation as possible. In this way the language becomes musical and pleasant to the ear.

We shall now proceed to the question of a vocabulary. In choosing the majority of his stems, Dr. Zamenhof had already followed the principle of maximum internationality, but the authors of *Neutral Idiom* were the first to carry out this principle scientifically for the whole language. Their procedure was, however, somewhat superficial, since in each particular case they calculated the number of languages to which a given word was common. One must not count the languages (and Latin especially must not be counted along with the living languages), but the people who use them, for languages are not organisms which possess an individual existence independent of those who speak them.[31] The proper rule, therefore, for determining the internationality of a word or stem is to count the number of people who understand it through

their mother tongue. This definition of the principle of maximum internationality is simply a necessary consequence of the fundamental principle of the greatest facility for the greatest number. It is natural that each person would prefer the use of the greatest number of words which are familiar to him, and so, to be impartial, we must attach the same value to the individual preferences of the 120,000,000 who speak English as to those of the 75,000,000 Germans, the 70,000,000 Russians, or the 50,000,000 French or Spanish, etc. Even the languages spoken by the smaller nations must be taken into account in proportion to their numbers.

The choice of the words for our neutral language is, therefore, a pure question of arithmetic. Statistics of the number of people who speak the different languages will not, however, furnish us with a complete solution of the problem. In the first place, there are to be found in the dictionaries technical words and special terms which are only known to a minority of each nation. In the second place, there occur cases where a word, though it does not belong to a language, is, nevertheless, known through one or more derivatives. For example, 100 is in English *hundred*, in German *hundert*, in Danish *hundrede*, and yet the root *cent* (*zent*) has been long familiar to the world through the terms *per cent*. (G. *prozent*), *centesimal*, *centimetre*, *centennial*, *century*, *centenary*, G. *zentner*, Danish *centner*. In the third place, even when "the same word" belongs to several languages, it very often possesses different forms, due mostly to a different phonetic development, with the result that the choice of a proper form is very often a delicate matter. The sounds of the word "change," which the English and French write in the same way, are very different; but as we can employ neither the nasal vowel of [32] the French nor the diphthong (*ei*) of the most usual English pronunciation, *chanj* would appear to be the most convenient form for all. In very many cases it is possible

to find a common denominator for the different forms. Had not in English and German the external form of many etymologically closely related words diverged so much that it is impossible to find a middle form (for example, water, *wasser*; tooth, *zahn*; speak, *sprechen*; soap, *seife*; week, *woche*), the Germanic element would have been the dominating one on account of the great number of those speaking these two related languages. Such being the case, the Romance element in English usually decides the matter in the majority of instances, since it coincides with the French, Spanish, and Italian, or at least with one of these languages, the result being that our language necessarily possesses a Romance form in a much higher degree than one might have thought. Another very important circumstance (which I have hinted at previously) acts in the same direction, the circumstance, namely, that numerous Latin derivatives have passed over into the Germanic languages even when the stem does not occur there. For example, German possesses the words *absentieren*, *abstinentz*, *artist*, *dentist*, *dental*, *moral*, *populär*, which greatly facilitate for a German the understanding of the words *absenta*, *abstenar*, *arto*, *dento*, *moro*, *populo*, although he does not possess them in his own language (with the exception of *pöbel* = *populacho*).

Sometimes there exists a very troublesome rivalry between two words. In order to render the substantive "arm" (limb) the proper word would seem to be the German, English, and Scandinavian "arm," until one makes the discovery that the same root "arm" in the sense of "weapon" is still more international (E., F., I., S., supported by *armée* G., E., F., R., *armata* I., *armada* S., *armieren* G., etc.), which compels us for "arm" (limb) to have recourse to a Romance form. In other cases a more or less arbitrary change of one of the [33] series of words appears to be the only means of avoiding confusing homonyms (namely, for

door *pordo* instead of *porto*, on account of *port* = carry), but this procedure must be employed with great caution. Before everything else it is necessary to avoid all disguising of words, which makes them unrecognisable, aptly described by M. Blondel as a masquerade. This was set up as a general principle in Volapük, and Esperanto is by no means free from it.

As an example of the conflicts which occur now and then may be quoted the expressions for the idea of "soul." "Soul" is the word which would be immediately understood by the greatest number of people, but we cannot employ the English diphthong *ōū*, as we must be very sparing in the use of diphthongs, since they cause very great difficulties in pronunciation. We cannot take over the word in the form *sol*, because we require this for the word "alone" (I. S. *solo*, internationally used in music, E. *sole*, F. *seul*). G. *seele*, supported by the Scandinavian *själ*, is not familiar to a sufficient number of people, and, besides, we require the word *sel* for "saddle" (F. I. S.). The French word *âme* will not do either, because it is not sufficiently well known outside France, and, besides, there is a difficulty here too, for *am-* is absolutely required for the idea of "love" on account of F. I. S. and many derivatives in E., not to mention the god Amor. The use of the Latin *anim-*, which is the basis of the Romance forms, is impossible, since we cannot do without the adjectival termination *-al*, and *animal* would then mean partly "relating to the soul," partly "animal," which cannot be permitted in an international language. We must resort to the device of changing *anim-* a little, whereby we get *anmo*. This example will show how complicated the task frequently is of finding an international word which will give rise to no confusion or misunderstanding.

The degree of internationality of the language of the<sup>[34]</sup> Delegation will be evident from the statistics of Couturat; he counted the roots of the first dictionaries

(5,379 in all) and found that of these the following numbers occur in the national languages:—

4,880,	<i>i.e.</i>	91	
4,454	"	83	"
4,237	"	79	"
4,219	"	79	"
3,302	"	61	"
2,821	"	52	"

For all these languages the above numbers are relatively higher than in the case of Esperanto.

One of the most effective means of simplifying the vocabulary of a language is a carefully worked-out system of word formation, which enables everyone, by means of a series of regular prefixes and suffixes, to form with the greatest ease a large number of new words, which are immediately intelligible to all who know the rules.

When one has judiciously chosen the roots which occur under different forms in the various natural languages and also selected the derivative terminations with all possible care, it is astonishing to observe how great a number of words derived with perfect regularity agree with the forms occurring in living languages.

With regard to grammar, the fundamental condition to be required of every system claiming to be an international language is that of perfect regularity. Every exception to the rules only serves to produce complications and to render the employment of the language difficult and uncertain. If one knows the conjugation of one verb, one must know the conjugation of all verbs, and so on.

In the choice of grammatical terminations the statistical method, which served us for the purpose of the vocabulary, cannot be strictly applied, because living languages

diverge[35] too much in this matter. Nevertheless it does not leave us entirely in the lurch.

Such cases as the dative and genitive and also the ablative, etc., must be expressed by prepositions in conformity with the tendency of Western European languages. It is advisable to have an inflection for the accusative, although this is only intended for occasional use, because in the great majority of instances there is no necessity to distinguish it from the nominative. As neither the Romance languages nor English and Scandinavian possess any accusative inflection, and as the Slavonic languages do not give us any help here, we are obliged to fall back on German, which in the feminine and neuter has no inflection. The masculine, however, in many cases has an *-n* (*den guten knaben*). The fact that this termination is also mostly used for the dative, as well as for the infinitive, need not prevent us employing it in our language for the accusative. It necessitates the use, however, of forms ending in a vowel for the nominative of substantives (and adjectives and pronouns). It may be remarked that *-n* as an accusative inflection is also found in Greek and Finnish.

The only vowels that can be employed in this connection are *o* and *a*, which, as a matter of fact, occur very frequently as the terminations of substantives and adjectives in the Slavonic languages, as well as in I. and S. Since grammatical gender, as distinct from sex, cannot be permitted in an artificial language, it is not possible to employ *o* and *a* as in natural languages, where the former is often, though not exclusively, used for the masculine (I. S., but in R. and Polish for the neuter), and the latter similarly for the feminine. One might be inclined to employ *o* for the male and *a* for the female sex, with the result that one would have no termination for inanimate things, abstract ideas, or living beings whose sex is not a matter of importance at the moment. The carrying out of this rule, however, leads to[36] considerable difficulties which would take too long to enter into here. (This is one

of the points which led to most discussion in the Delegation Committee.) As a matter of fact, a very great deal can be said in favour of the Esperanto usage of *o* for the substantive and *a* for the adjective, and, as Couturat has remarked, *la bona viro* is not any stranger than the Italian *il buono poeta*.

We need have no compunction in leaving the qualifying adjective without inflection, as is done, for instance, in English. The ending *-i* is very suitable for the plural of substantives, being used for this purpose in Italian, in Russian and the other Slavonic languages, as well as in modern Greek; it is also tolerably familiar to the English in foreign words, such as *banditti*. The only termination which might dispute the honours with *-i* is *-s* (F., although usually silent, S., E., G. partly, and Dutch), but *-s* cannot be used if we employ the accusative termination *-n*, as neither *virosn* nor *viros* could be permitted.

As regards the inflections of verbs, we are bound, if we want a termination for the infinitive, to choose, according to our fundamental principle, the *-r* of all the Romance languages, because neither the German *-n*, which we have used for other purposes, nor the palatised Slavonic *-t* (or *-ć*), can be employed, and English possesses no inflection. We require a vowel before the *-r*, the choice of which will be evident from what follows. For the active and passive participles we need only consider *-nt* and *-t* respectively, the vowels being also left undecided for the present. The greatest difficulty, however, is caused by the finite tenses, in which we must distinguish present, past, and future. In this respect living languages differ so much amongst themselves that the principle of maximum internationality does not suffice, especially as the inflections of tense are inextricably mixed up with those of person and number, which for our purposes are quite unnecessary. The Delegation Committee<sup>[37]</sup> have, therefore, for the moment been unable to find anything better than the Esperanto usage of *-as* for the present, *-is* for the past,

and *-os* for the future. The same series of vowels may also be employed for the infinitive and participles, so that the normal forms are *-ar*, *-anta*, and *-ata* (the final vowel *a* here being the adjectival termination), whilst *-ir*, *-inta*, *-ita*, and *-or*, *-onta*, *-ota*, respectively may be retained for the less frequent cases where one wishes to indicate expressly another tense in the infinitive or participle. A few *à priori* inflections will not cause much harm in a grammar which is so easy that it may be mastered in half an hour.

I have now arrived at the end of my investigation, in which I have endeavoured to show the method whereby the language of the Delegation has been constructed. The result is a language that everyone can easily master, and which possesses the advantage over other languages that it is based on rational scientific principles and, therefore, need not fear that some fine day it will be replaced by another and sensibly different language. Naturally improvements will be effected in details where the fundamental principles have not been sufficiently worked out, but the foundation is sound, and the common auxiliary language of mankind cannot differ very much from our "Internaciona linguo," or, to give it a shorter name, "Interlinguo," or, still shorter, "Ilo" (from the initial letters).

OTTO JESPERSEN.

## APPENDIX

### CRITICISM OF ESPERANTO

In connection with the foregoing some critical remarks on Esperanto may be made, from which one will readily perceive the reasons which made it impossible for the *Délégation pour l'Adoption d'une Langue Internationale* to<sup>[38]</sup> adopt Esperanto in its present form as the international auxiliary language.



Dr. Zamenhof has given us an interesting account of the way in which his language gradually developed in his mind while he was at the Warsaw Gymnasium. Before he arrived at the conviction that the material for the vocabulary must be obtained from the Romance and Germanic languages, and that the already existing stock of international words must be used, he had "simply invented" his words, that is to say, chosen them quite arbitrarily, but with as much regard to system and brevity as possible. Although he himself noticed that such words are difficult to learn and still more difficult to remember, he has unfortunately retained in the finished language a whole series of such *à priori* formations, which appear in words of such frequent occurrence as *who, how, where, never, everywhere, etc.* The *nul tempe* and *pro quo* chosen by the Delegation agree, however, much better with the general character of language than the *neniam* and *kial* of Dr. Zamenhof.

Some peculiarities may be accounted for by the Slavonic mother tongue of the author: for example, his preference for sibilants and diphthongs, which is especially evident in the invented words (e.g., *chi*, here; *chiu*, each; *ech*, even; *ghi*, that; *ghis*, until, *gh* and *ch* being pronounced as E. *j* and *ch*). In an article in Zamenhof's *Krestomatia* I find, for example (p. 288), *chiuj tiuj senantaujughaj kaj honestaj homoj, kiu, anstatau filizofadi pri ghi*, and (p. 293) *tion chi ankoraŭ antaŭ la apero de la unua arta lingvo antaŭvidis kaj antaŭdiris chiuj tiuj eminentaj kapoj, kiu, etc.* The method of writing *x* is also Russian: *ekzameni, ekzemplo, etc.,* and also *ekspedi, eksplodi*; also *kv* for *qu*. French words with *oi* take *ua* in Esperanto when they are spelt in this way in Russian, e.g., *trotuaro, tualetto, vuala*; otherwise they are spelt with *oi* or *oj*, e.g., *foiro, fojo, foino. Nacio, tradicio, etc.,* instead of *-iono*, is also Russian. Russian[39] usage has

doubtless also inspired such word formations as *elparoli* and *senkulpigi* instead of the international *pronuncar* and *exkuzar* (R. *vygovarivat'* and *izvin'at'*, corresponding to G. *aussprechen* and *entschuldigen*). The peculiarity of using the adverb instead of the adjective in such cases as *estas necese vidi*, "it is necessary to see," is probably to be ascribed to the correspondence of the Russian adverb with the neuter predicate adjective. This rule cannot be permitted, however, in an international language, because, with a free word order, it would be impossible to say whether *estas vere necese* means "it is really necessary" or "it is necessarily true." The compound perfect (*mi estas aminta*, "I have loved" = "I am having loved") reminds one of the Polish *kochal-em*. Finally, the frequent use of the adjective (in *-a*) instead of the genitive (*Zamenhofa lingvo*) and of the two sorts of action expressed by *ek* and *ad* (*ekvidi* and *vidadi* used in many cases where the simple *vidi* would be sufficient) are to be accounted for by Russian usages.

Naturally I do not object to the importation of national peculiarities into the international auxiliary language when the latter is enriched thereby. For example, one must make use of the facility for forming compound words common to the Germanic and Slavonic languages in preference to the poverty of Romance languages in this respect, and combine it with the more Romance characteristic of forming new words by means of derivative syllables. But peculiarities of national language which render mutual comprehension and international usage difficult must be most carefully avoided.

The unpractical nature of the circumflexed letters has been indicated previously. It may be remarked here, however, that in point of system Zamenhof's letters are very inferior to the similar ones employed in the Czech language, since the parallelism in sound

between *s* and *ŝ*, *z* and *ĵ*, *dz*[40] and *ĝ*, is disguised by the choice of letters. This produces a very amateurish effect.

Besides the familiar parts of speech which are indicated by special terminations, Zamenhof invented a new class characterised by the termination *-au* (*kontrau*, *almenau*); but the limits of this class, which includes some, but not all, adverbs and prepositions, are not clearly defined.

Many words taken from existing languages are disguised, almost after the fashion of Volapük: *boji*, F. *aboyer*; *parkere*, F. *par cœur*; *shvit*, G. *schwitzen*, E. *sweat*; *char*, F. *car*; *faruno* instead of *farin*; *lerta*, F. *alerte* (with a changed meaning), etc. In this category is to be classed the astonishing *nepre* (entirely) which is derived from the Russian *nepremeno*, just as if one were to take from the German word *unbedingt* the two first syllables and propose *unbe* as an international word instead of *absolute*. The economy in the use of stems was carried much too far in Esperanto, necessitating the employment of all sorts of compound words, the discovery of whose meaning requires much racking of one's brains. The employment of all the derivative syllables also as independent words is very ingenious, but produces a very strange impression on the uninitiated.

The method of word formation is greatly wanting in precision, the limits of the so-called direct derivation in particular being not sufficiently clearly indicated. One example will suffice. Starting out from *kroni* = to crown, *krono* ought properly to mean crowning, instead of which it signifies crown, so that one is forced to use *kronado* for crowning, whereas, according to the rules of Esperanto, *kronado* must mean continuous or repeated crowning, as if a king were being constantly or repeatedly crowned.<sup>[41]</sup>

[41]

I have brought together here the most important defects in Esperanto, the removal of which formed one of the tasks of the Delegation Committee. The knowledge of these imperfections does not prevent me from recognising the meritorious services of Zamenhof, who, at a time when the question of the best construction of an international language was not seriously discussed, succeeded in producing one which was in many respects superior to the attempts of that time, and which has proved in practice a serviceable, though very imperfect, means of international communication.

OTTO JESPERSEN.

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[42]

## CHAPTER IV

### ON THE APPLICATION OF LOGIC TO THE PROBLEM OF AN INTERNATIONAL LANGUAGE

The problem of an international language has a theoretical as well as a practical importance. I have no intention of discussing the latter here and of explaining once more the necessity of an auxiliary language for international relations of every sort, and the practical possibility of making oneself understood by means of an artificial language, a possibility which has been proved by experience. But an international language is also, according to the words of the celebrated philologist H. Schuchardt, a desideratum of science, in which connection it raises at once problems of philology and logic. That these problems are worthy of the study of scientific men is proved by the discussions of Professors Diels and

Gomperz, the reports made to the Academy of Sciences of Leipzig by Professors Brugmann and Leskien, and, finally, the labours and decisions of the Committee of the *Délégation pour l'Adoption d'une Langue Internationale*. The latter, composed of highly competent scientists and linguists, has determined the principles necessary for an auxiliary language, and has practically realised them.

My desire in what follows is to show briefly the connection of the international language with logic, and its claims on the attention and interest of philosophers. In the words of Leibnitz, "Languages form the best mirror for the human spirit, and an exact analysis of the meaning and relationship of words would be the best means of disclosing the operations of the mind" (*N. Essais*, III., VII., end). But the majority of philosophers (with some distinguished exceptions, *e.g.*, [43] Professor Wundt) and the majority of linguists (also with some distinguished exceptions, *e.g.*, M. Bréal) have given little attention to the study of language from the point of view of psychology and logic. Now this study is particularly easy and interesting in the case of an artificial language, since the latter presents a structure analogous to that of our existing languages, but much simpler and more regular.

The words of the international language consist of invariable elements (morphemes) of three sorts: stems, derivative affixes (prefixes and suffixes), and grammatical inflections which, as in the case of European languages, are always final letters or final syllables. The stems themselves can be divided into two categories: verb stems, which express a state, action, or relation, *e.g.*, *dorm*, *parol*, *frap*; and non-verbal or nominal stems, which denote an object (living being or thing), or express an aspect of it, *e.g.*, *hom*, *dom*, *bel*, *blind*. The latter can produce directly only names (substantives or adjectives): man, house, beautiful, blind (in Ido, *homo*, *domo*, *bela*, *blinda*);

the former, on the contrary, produce directly verbs: to sleep, to speak, to strike (in Ido, *dormar*, *parolar*, *frapar*), but they can also give rise to nouns: sleep, word, blow (in Ido, *dormo*, *parolo*, *frapo*). The proper rôle of the grammatical terminations is to determine the grammatical function of a stem word and to indicate the category to which the word belongs, whether verb, substantive, or adverb. Thus *parol-ar* = to speak; *parol-o* = (spoken) word; *parol-a* = oral; *parol-e* = orally. The same idea, namely, that expressed by the stem word, always runs through the various categories. This follows from a principle which dominates the whole structure of the international language: "Every word element" (morpheme) "represents an elementary idea, which is always the same, so that a combination of elements has a meaning determined by the combination of the corresponding ideas." This principle is only a corollary to the general principle of uniqueness so clearly<sup>[44]</sup> enunciated by Ostwald: "There exists a unique and reciprocal correspondence between the ideas and the morphemes which express them." This principle represents evidently the ideal of all language, for a language, being essentially a system of symbols, is only theoretically perfect (and useful and convenient in practice) when there exists a unique correspondence between the symbol and the idea symbolised.

Now it follows from this principle that it is quite incorrect to say, as is often done, "Being given a stem, it suffices to add to it *-ar* to form a verb, *-o* to form a substantive, *-a* to form an adjective"; we require to define the sense possessed by this verb, substantive, and adjective. In other words, to every derivative of form there must correspond a derivative of sense which is in no wise arbitrary, but determined by general rules. If *dorm-ar* = to sleep, *dorm-o* cannot mean indifferently the sleeper, the dormitory, or the desire to sleep; if *blind-a* = blind, *blind-o* cannot signify at pleasure either blindness or the act of

blinding. The rule which must guide us here is the principle enunciated above, namely, that a stem always preserves the same sense and expresses the same idea; if one wishes to express another idea related to the former in a definite way, it is necessary to add to the stem a morpheme expressing this relationship. The morphemes which denote the relations of our ideas are the affixes of derivation, which permit us to express a whole family of ideas by the aid and as the function of one fundamental idea, and to form correspondingly a family of words all derived from the same stem, as occurs, as a matter of fact, in natural languages. Certain of these affixes are wrongly classed amongst the grammatical inflections, such as, for example, the participial suffixes which serve to derive an adjective or a substantive from a verb, denoting him who performs the action, or is affected by (subject to) the state or relationship expressed by the stem: *dorm-ant-a = sleeping*, [45] *arol-ant-a = speaking*, whence, by simple change of the final letter, *dorm-ant-o = sleeper*, *parol-ant-o = speaker*. One will perceive thereby the difference between *direct* derivation, which is effected by means of the grammatical inflections, and *indirect* derivation, which is effected by means of the addition of affixes. There is nothing arbitrary about this distinction, for it rests on the logical principles enunciated above, which determine the theoretical and practical value of the international language.

From these principles follow at once the rules of direct derivation. If one starts from a verbal stem, what must be the sense of the substantive directly derived from it? This sense can be none other than the state or action expressed by the verb: *dormar = to sleep*, *dormo = sleep*; *parolar = to speak*, *parolo = a word*; *frapar = to strike*, *frapo = a blow*. In these derived words we perceive the sense of the verb stem, and the proof of that is that in our natural languages we often employ the infinitive for this purpose: *le manger*, *le*

*boire, le dormir, le rire; das rennen* (in English the verbal in *-ing* is employed with the sense of the infinitive). Indeed, one might completely identify the verbal substantive with the infinitive.

If one starts from a substantival stem, what must be the relation between the adjective and substantive derived from it? They must necessarily have the same sense, whichever of the two one considers the primary word; if *avara* = *avaricious*, *avaro* = *an avaricious person*; if *blinda* = *blind*, *blindo* = *a blind person*. This rule is all the more necessary in practice as there are a crowd of substantival stems concerning which one could not say whether they produce at first a substantive or an adjective: *vidva* = *widowed*, *vidvo* = *widower*; *nobela* = *noble*, *nobelo* = *nobleman*; *santa* = *holy*, *santo* = *a saint*. This is particularly true of the names of followers of this or that doctrine: *katoliko*, *katolika*; *skeptiko*, *skeptika*, etc. No one would think of using any suffix to derive one of these<sup>[46]</sup> words from the other. There is only a very slight difference of meaning between a *katolika skeptiko* and a *skeptika katoliko*, the substantive indicating in each case the primary and fundamental idea to which the other is superadded.

This brings us to the enunciation of the *principle of reversibility*, which may be formulated as follows: "Every derivation must be *reversible*; that is to say, if one passes from one word to another of the same family in virtue of a certain rule, one must be able to pass inversely from the second to the first in virtue of a rule which is exactly the inverse of the preceding." That is an evident corollary of the *principle of uniqueness*, for otherwise one would be led to give two meanings to the same word. Let us suppose, for example, that from the noun *krono*, = *a crown*, one imagines it possible to derive directly (as is the case in certain languages) the verb *kronar* = *to crown*. From this verb one could deduce inversely in virtue of the general rule the substantive *krono* = *coronation*, so that the same



word *krono* would then mean both *crown* and *coronation*. That would be, however, a logical error inadmissible in the international language, however numerous may be the examples of it which occur in living languages. On the contrary, thanks to the principle of reversibility, one can proceed from any word whatsoever of a family and arrive at any other word of the same family, or return to the initial word, in an absolutely unique manner, whereas if one did not observe this principle one would inevitably obtain two meanings for the same word.

The principle of reversibility fixes the rules of direct derivation for the cases which are the converse of those we have studied. Just as the substantive directly derived from a verb denotes the state or action expressed by this verb (or, more strictly, by its root), so a verb can be derived directly from a substantive only if the latter expresses an action or a state. For example, *paco* = *peace*; can one<sup>[47]</sup> form the verb *pacar*, and if so what will be its meaning? This verb can only signify one thing, *to be in the state of peace*, and not *to pacify* or *make peace*, for in that case *paco* would mean *pacification* or *conclusion of peace*, and not the *state of peace*. Similarly, if one can and must convert an adjective into a noun by the simple substitution of *-o* for *-a*, the adjective immediately derived from a substantive can only mean "what is —." If *homo* = *a man* (a human being), *homa* can only mean *human* in the sense of *which is a man* (human being); *homa ento* = *a human being*. But if one wishes to obtain an adjective signifying "which belongs to —," "which relates to —," "which depends on —," it is necessary to employ a suffix (*-al*): *homala manuo* = *a human hand*. One might equally well say *manuo di homo* = *the hand of a man* (human being). But just as the preposition *di* is indispensable for indicating the relationship between two ideas which are not simply juxtaposed, but depend on each other, so, if we wish to express one of the ideas in adjectival form, we require a

suffix which also expresses this relation or dependence. Besides, a suffix of this nature exists under different forms in all our languages: G. *-isch*; E. *-ic, -al, -ical*; F. *-ique, -al, -el*; I. *-ico*; S. *-ico*. The choice of *-al* rather than *-ik* was determined by reasons of euphony and also internationality, the derivative adjectives employed in science (the most international of all) ending often in *-al*: *mental, vocal, spatial; rationnel, universel, fonctionnel*, etc.

In this connection we shall make a general remark. The international language borrows its *stems* from the European languages according to the principle of maximum internationality, *i.e.*, adopts for each idea the most international stem, namely, that which is familiar to the greatest number of men. But it cannot, and must not, borrow their derivatives from living languages without losing all its theoretical and practical advantages, because the natural derivatives[48] are too irregular. Sometimes the same affix has several different meanings; sometimes the same relationship is expressed by different affixes. In virtue of the principle of uniqueness, it is necessary to unify and regularise the meaning and employment of the affixes, assigning to each one a perfectly definite significance and function. Undoubtedly one must endeavour to adopt for the affixes forms which are international (as much as possible), or at least known in some language (like the suffix *-in* of the feminine, borrowed from the German, *e.g.*, *königin*, and the prefix *mal-*, denoting "a contrary," borrowed from the French, *e.g.*, *malheureux*), so as to reproduce as much as possible international derivatives. But it is chimerical to endeavour to reproduce them all, since they are irregular and consequently incompatible with that logical regularity of the language on which is based not only its fertility, but also its simplicity in practical use and its facility for *all nationalities* (even for non-European peoples who are not familiar with the anomalies and caprices of European

languages). The international language must be autonomous in its formation of words; when the elements which it borrows from our languages have been once chosen (in the best possible manner), it must combine them freely according to its own rules, preserving their form and sense rigorously invariable. It is by virtue of this condition that it becomes a true language, richer in certain respects than our own, since it can form all the useful derivatives which are often wanting in one or the other, and not merely a simple imitation or copy of our languages, which would be as difficult as they, and which would require a previous knowledge of them.

We shall not explain here all the forms of indirect derivation, or enumerate the forty-seven affixes used for this purpose. We shall quote only a few of them for the sake of example, in order to show the application of the principles enunciated above. If there is one suffix which<sup>[49]</sup> is particularly useful to philosophers, it is that which enables one to derive from an adjective the name of the corresponding abstract quality; that is the Greek suffix *-otet* and the Latin suffix *-itat* (*-itud*), whence have come the French *-ité*, the English *-ity*, the Italian *-ita*, the Spanish *-itad*; and the German suffix *-heit* or *-keit*, etc. We perceive here a logical relation well known and made use of in all our languages. It must find a place in the international language, but by what suffix ought it to be represented? Now, if one analyses the idea involved in this suffix, one will find that *beauty*, *health*, *blindness*, are simply the states or facts of being beautiful, healthy, blind. The idea involved in this suffix is then the idea of *being*, not the idea of existence, but the idea of *being* such and such, the idea of attribution which is expressed by the copula *est*. It is natural, therefore, to represent it by the Indo-European stem of the verb *to be*, namely, *es*; *bel-es-o* = *beauty*; *san-es-o* = *health*; *blind-es-o* = *blindness*. The fact that this suffix recalls a French suffix (*richesse*), an Italian suffix (*bellezza*), and an English suffix -

*ness (happiness)* employed in the same sense can only serve as an accessory confirmation of the above choice, which was dictated by logical motives. Moreover, this agrees perfectly with our general rules; *to be well* will be translated by *esar sana* or *san-esar*, and the fact of being well will be *saneso = health*. Conversely, if we start from *saneso = health*, we can form the verb *sanesar = to be in (good) health*. Whatever may be the point of departure, there is no fear of making a mistake or "going off the rails" in forming these derivatives, if we observe the principle of reversibility. It would, therefore, be not only arbitrary, but absurd, to express *health* by *sano*, which latter can only mean a healthy being. For one must not imagine, as is often stated, that an adjective expresses a quality; it expresses precisely *he who, or that which, possesses the quality in question*. That is why all our languages employ[50] a suffix for the purpose of deriving from an adjective the name of the corresponding quality.

But our languages often require to express the inverse relation, namely, that of the individual possessing a quality to that quality. For just as there are names of qualities which are derived from adjectives, as *beauté, gaieté, bellezza, tapferkeit, gleichheit*, so there are others which are primary and from which, therefore, the corresponding adjectives are derived: *courage, courageux; joie, joyeux; beauty, beautiful; glück, glücklich; freude, freudig*. And, as one sees, our languages employ in these cases a series of analogous suffixes. The international language must evidently imitate them, for it cannot decree that all the names of qualities shall be derivative, nor that they shall all be primary; that would amount to an arbitrary uniformity contrary to the spirit of our languages and probably also to our logical instincts. The international language must, therefore, have a suffix which will serve to derive from the name of a quality the name of the possessor of that quality. That [will be -oz](#), a Latin suffix (*formosus, generosus*, etc.),

occurring very frequently in the Romance and even Germanic languages (*mysteriös, mysterious, mystérieux, misterioso*). This suffix is the logical inverse of the preceding one (-es) and is quite as indispensable as it. It is a curious fact that our languages exhibit examples of the superposition of these two suffixes considered in respect of their sense, if not their

form: *glück, glücklich, glücklichkeit; beauty, beautiful, beautifulness*. Latin has derived *formosus* from *forma*; Spanish in its turn has derived *hermosura* from *hermoso*, etc. Languages also provide us with frequent examples of the reciprocity of these suffixes.

*gaieté;*  
*gaiety;*  
*allegrezza;*  
*fröhlichkeit;*

On the other hand,  
*joie*  
*joy*  
*gioja*  
*freude*

[51]

The international language is, therefore, faithful not only to logic, but to the spirit of our languages, in admitting at the same time the two inverse derivations: *gaya, gayeso; joyo, joyoza*. A language which contained the suffix -es, and not the suffix -oz, would be lame or one-armed.

Besides, this lacuna would manifest itself very quickly in further derivations, for the latter would violate the principle of reversibility and therefore that of uniqueness. If from *joyo* were derived *joya*, from this adjective, analogous to *gaya*, one could derive inversely *joyeso = joyo*, thus producing two names for the same quality (just as above *sano* would have been synonymous with *saneso*). If from *kurajo* (*courage*) were derived *kuraja* (*courageous*), one could derive from the

latter *kurajeso*, synonymous with *kurajo*. And, on the other hand, *kurajo* being the substantive of *kuraja*, this word would signify both *courage* and a *courageous person*. From want of a single suffix the whole series of derivations would become confused and illogical, just as in a chain of reasoning a single error, or in an algebraical calculation a single false equation, would lead to the most absurd conclusions.

To sum up, one must take care not to derive a word directly from another, except when they both express the same idea (apart from the difference of their grammatical *rôle* in the sentence). Consequently, whenever the sense changes, a word element must be added or disappear, in order to translate the modification of the idea. It is by virtue of this condition that the language will become the exact and faithful expression of our thoughts, and will conform to that indwelling and instinctive logic which, in spite of all sorts of irregularities and exceptions, animates our languages. In its system of derivation as well as in the rest of its structure, the international language is nothing but a purified and idealised extract, a quintessence of the European languages. The logic which holds sway there is not the Aristotelian logic of genus and species, but rather<sup>[52]</sup> that logic newly constituted under the name of the *logic of relationships*, which is, however, as old as the world, since it lies, though obscurely, at the basis of the formative processes in our natural languages. That is the reason why the international language offers to philosophers a particularly instructive field of study. It is worthy of their interest in other respects. Not only does it offer to them, as it does to all men, a *medium of communication* between all countries, but it furnishes them also with an *instrument of precision* for the analysis and exact expression of the forms of thought, which is very superior, from the point of view of logic, to our traditional languages, encumbered as these are with confused and ambiguous expressions. It is

their duty to contribute to the development and perfecting of a language which, without losing anything of its practical qualities, can and must realise by degrees the ideal of human language; if it is true that there *does* exist an ideal in our languages, though hidden and irremediably disfigured by all sorts of anomalies. To quote a saying of Schuchardt, *Was die Sprache gewollt haben die Sprachen zerstört.*<sup>[5]</sup>

L. COUTURAT.

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[53]

## CHAPTER V

### THE RELATIONSHIP OF THE INTERNATIONAL LANGUAGE TO SCIENCE

Whilst the preceding chapters have sufficiently demonstrated that the construction of an artificial international language is not only possible, but already in all probability fixed as regards its fundamental principles, it will be desirable here to give some account of the inner relations between science and the auxiliary language.

Without doubt one of the most important conditions to be satisfied by an artificial international language is, that it should be capable of being employed in science. Considering the leading part which science plays to-day in the life of nations, the system which this intellectual Great Power will adopt cannot be a matter of indifference; indeed, its capability of serving the needs of science might well be regarded as the test of an artificial language. It is, for example, conceivable that a particular system, although

unsuitable for the purposes of science, might work quite well so far as commercial relations are concerned.

Before we examine the relationship between science and auxiliary language the question may be asked whether an international language is at all necessary in science, and whether it is likely to be introduced therein. We may consider that this question has been settled by the discussions contained in the previous chapters. The general question of the introduction of an artificial auxiliary language having been answered in the affirmative, the further question may be raised as to why, in spite of the existence of different[54] artificial auxiliary languages, such as Volapük, Esperanto, Neutral Idiom, Novilatin, Universal, etc., science has not long ago adopted and introduced one of them. Quite apart from the actual circumstances which have prevented this, a perfectly precise answer may be given to the above question. There have not been wanting experiments in this direction. Already in the Volapük period endeavours were made to translate scientific works into Volapük in order to prove that this language could also be of service to science. In particular the translations of Dr. Miess's *Craniology*, Dr. Winkler's *Petrification of Fishes*, and the *Eastern Travels* of the Crown Prince Rudolph were boasted of by the Volapükists. Esperanto has gone further, and is, as a matter of fact, more capable of development in this direction. There appears a periodical, *Scienca Revuo*, which in popular form conveys the most important results of different sciences to Esperanto readers. Fechner's little book on life after death and some others have also been translated. All these attempts possess an extraordinary interest for the great experiment in language on which mankind has been engaged during the last twenty years, and the greatest thanks are due to their authors. It is only, indeed, after many attempts that an experiment can be successfully carried through. But, without wishing to deny that very remarkable things have been accomplished, all



these experiments prove one fact beyond question, namely, that the languages mentioned do not even approximately, and cannot indeed possibly, satisfy the requirements which science must demand of the artificial auxiliary language. Science could not, therefore, have chosen any of these languages as the artificial auxiliary language even had she wished, nor could she do so in the future without experiencing failure. An examination of the reasons for this state of affairs will enable us to arrive at the relation between science and the international auxiliary language. It can be shown what the[55] nature of this relationship must be, and it follows therefrom whether any particular system will or will not be serviceable to science. There are two necessary criteria, namely, internationality of vocabulary and logical precision of expression.

One might be inclined to emphasise the importance of the second criterion without paying any attention whatever to the first, and to regard a system constructed on a purely logical basis as alone worthy of science. But this would be a retrograde step, for indeed the question of artificial language originated with the idea of a so-called philosophical language in the mind of Leibnitz and afterwards. If one takes the point of view that the scientific auxiliary language should be constructed on an ideographic basis (that is to say, a system of correlation between symbols and ideas, which, however, as it is a language, must be capable of being spoken), one arrives at an *à priori* system, as it is called in the theory of universal language. Thanks to the laborious and self-sacrificing work of the thousands who during the last twenty years have devoted and still devote themselves to the great experiments in language, we are able nowadays to refer this question to the test of experience. The latter has shown with absolute certainty that *à priori systems cannot be spoken*. The learning of any natural language, with all its irregularities, peculiarities, and anomalies, is child's play compared to the learning of an *à priori* system. All

experiments in this direction have failed and need no longer be seriously considered. But even when an artificial language has not been constructed *à priori* another error, producing much the same effect, may very greatly injure its facility in practice. An otherwise so successful system as Volapük came finally to grief through an error of this sort. Although Volapük was constructed by a man of whom it is said that he was master of, or at least acquainted with, fifty-five living[56] languages, and although, according to its whole nature, it appeared to be modelled very closely on natural languages, nevertheless the abbreviations which Schleyer introduced so often into the words he took over (for example, *vol* for *world*, *pük* for *speak*, *Melop* for *America*) produced the same psychological effect as if his word-formations had been *à priori*. Man is, in fact, a psychological as well as a logical being. If there is to be any practical outcome, we must, therefore, under all circumstances base our work on the psychological principle of internationality. It is only this which confers on the auxiliary language the quality of being easily learnt and spoken, which is unconditionally necessary for its practical use in science, as in other departments of life. Such systems are called *à posteriori*, and experience shows that the more *à posteriori* elements are contained in an international language the more it conforms to Jespersen's fundamental principle of *the greatest ease for the greatest number of people*. But, one may argue, does it not follow from this that the best solution would be the introduction of a *national* language into science? Certainly not, for this would not offer the greatest facility to the greatest number of people, because the formation of the so-called idioms, which, apart from grammatical difficulties, hinder the learning and use of a language, would in the case of many national languages interfere with the internationality of the vocabulary. These idioms have a very similar effect to the *à priori* word formations, and diminish the intelligibility, lucidity, and facility of

logical expression. The only international auxiliary language which will be of practical use in science will be constructed according to the *à posteriori* principle of maximum internationality, and will be almost or entirely free from idioms. If we add to this that it must possess that logical clearness of expression which we have described above as the second criterion, we have the general conditions which[57] must be satisfied by an international language suitable for science.

Apart from the practical value of the principle of internationality, there exists in science another very special reason for regarding it as a necessary condition to be satisfied by an international auxiliary language.

We may inquire, in fact, from a purely scientific standpoint, how far the systems which have been devised up to the present have adjusted themselves to the international language which already exists in science. For all the thousands of words in scientific and technical nomenclature which, apart from their nationality, the scientific men of all countries have been inventing for centuries according to very uniform principles, as well as the likewise largely international expressions of "unofficial" nomenclature, form a possession of modern scientific civilisation of such magnitude, importance, and value, that it cannot on any account be sacrificed. On the contrary, all these words, as well as many similar ones derived from daily life, form the true, natural, and practical basis of international language.

*This* international auxiliary language, which forms one of the foundation stones of our general, scientific, and technical culture, is so closely bound up with the life and existence of science and has become so much the second nature of all scientific men, especially investigators, that they have long become accustomed to write and think in this language apart from their nationality. It is an easily ascertained fact, and one that is well known to the

scientific men of all countries, that the latter can read foreign scientific literature much more easily than newspapers or novels written in the same languages. The explanation of this is that the foreign scientific works, on account of their technical vocabulary, are written in a language which possesses a much more international character than that of the novels or newspapers. It cannot, therefore, be denied that there actually exist[58] already, particularly in science, the beginnings of an international (and largely artificially created) auxiliary language which is written, spoken, and read. We find here ready made the first provisional lexicon of the scientific international language. It cannot, therefore, be urged that science should "select" any one of the proposed artificial languages, because the selection of words is by no means an arbitrary process. The only procedure possible to science must be the construction of an international language on the basis of the already existing foundations. Science can never accept as an international language, one which destroys the actually existing internationality of scientific nomenclature.

As we see, these considerations, like the former, lead us to the conclusion that the auxiliary language must be based on the principle of maximum internationality; that is to say, its vocabulary must be taken *à posteriori* from the international treasury, and must not be invented according to any *à priori* system or special idiom. It follows from this that the auxiliary language of the future must inevitably be chiefly Romance in its character, for Latin is the international auxiliary language which still lives and flourishes for, and by means of, science.

The objection might be made here that the simplest solution would be the reintroduction of Latin into science as the auxiliary language. But this contradicts one of our fundamental premises, for Latin fails just as much as all other national languages to satisfy our second criterion,

namely, that of complete logical precision. Besides, it is too difficult.

Esperanto does not even approximately satisfy the necessary conditions; it infringes, in fact, all three. On the one hand, its vocabulary is very far from being constructed according to the principle of maximum internationality; on the other hand, the Esperantists are supposed to make up for this defect by the famous principle of [59] *vortfarado* (i.e., word manufacture!), with the result that their language falls into the error of creating idioms. For example, in Esperanto the beginning of the sentence "A rotary transformer might be called a motor-generator, but the latter name is usually applied to machines with independent armatures," is translated in the following way: *Turnighan alispecigilon oni povas nomi motorproduktanto*, which literally translated reads, "A self-turning otherwise-making instrument can be called a motor-producer."

Apart from these fundamental errors of Esperanto, it lacks a systematic method of word formation, the importance of which has been demonstrated in a masterly and convincing fashion by Couturat in the previous chapter. Hundreds of times the puzzled reader of an Esperanto text is in doubt about the sense of an adjective, even such common expressions as *stony* and *made of stone* being rendered in Esperanto by the *same word* (*shtona*). A phrase such as "It is perhaps possible" cannot be accurately translated into Esperanto, since, on account of its "simplicity," the words *perhaps* and *possible* are both rendered by the same *à priori* word, *eble*. With regard to choice of vocabulary, other systems, in particular "Neutral Idiom," are exceedingly superior to Esperanto. In this last product of the Volapük movement the principle of internationality has been finally recognised. A language academy was founded which constructed a lexicon according to this principle. Unfortunately, as Jespersen has very fully

shown in [Chapter III](#), this principle was not interpreted in the right manner, so that the language lacks logical clearness in spite of the international character of its vocabulary.

We need not, therefore, be surprised that science has hitherto been unable to adopt any of the artificial systems as the international auxiliary language. That would have been a false step, and would only have produced confusion.

It is only at the present time that one has arrived at a[60] clear recognition of the principles on which such a language must be based. The only artificial system which can claim that its "inventors" have endeavoured in its "construction" to *combine* and consistently carry out the principles of internationality and logical precision (namely, systematic choice of stems and a regular system of derivation) is, as will be sufficiently evident from the preceding chapters of this book, the language of the Delegation. Without doubt the *internaciona linguo di la Delegitaro* will have to undergo changes and improvements, for one cannot expect that such a gigantic task as the introduction of an international auxiliary language can be accomplished all at once. We hold, however, that "Ido" represents the first artificial language concerning whose introduction into science serious discussion is possible. We may state with full confidence to-day that, so far as human calculation is possible, the attempt to carry this out will be crowned with success.

On the other hand, this introduction will not be without a useful reaction on science, not only in respect to the development and extension of its external life as an international Great Power, but also with regard to the more perfect unification and extension of its language and nomenclature on the lines of strict and complete internationality. An expression of opinion on this point will be given in the following chapter.

[61]

## CHAPTER VI

### THE QUESTION OF NOMENCLATURE

If we take up a book or a paper dealing with mathematics (especially analysis) printed in a language, such as Japanese, which is quite unintelligible to us, we shall, nevertheless, soon succeed in finding out what it is about and often in understanding its main contents. The reason of this is, of course, that the mathematical formulæ consist of symbols which are intelligible to us because they are used in the same manner by all civilised nations. The same thing holds good in physics, and especially in chemistry; chemical formulæ contain at the present day such detailed information concerning the relationships of the substances symbolised, that one might conceive the possibility of writing a chemical paper with formulæ alone.

In the case of the descriptive natural sciences, the Latin names of the genera and species, the Latin nomenclature of anatomy and other similar groups, form a common international possession. Physiology, biology, sociology, as well as history and ancient philology, possess as yet, however, no system of internationally intelligible terms. In modern philology (phonetics) practical endeavours have already been made to construct an international system of sound symbols. All these sciences possess naturally the designation of numbers by means of numerals which have a perfectly international character. Since in mathematics

not only the quantities, but also the operations, are denoted by universally understood symbols, it is already possible, with comparatively few additions, to express long trains of [62] mathematical thought in a manner which is internationally intelligible, that is, intelligible to those who are acquainted with the science and its symbols. For a considerable time Professor Peano, in Turin, has been publishing works written in this manner. We perceive here the realisation of the ideal of a purely ideographic language, which can be read by the specialist without his requiring to translate it into the words of any particular form of speech.

To quote a similar example from chemistry, J. H. van't Hoff, in one of the publications of his youth, avoided assigning names to the chemical substances with which he dealt, considering that his meaning would be much better conveyed by the corresponding structural formulæ. Such a text would be quite intelligible to a trained chemist without the formulæ calling up in his mind any particular words, indeed without any such words existing at all.

These well-known facts show *that the problem of an international language has already been partly solved in science*. In so far as definite and fairly stable concepts have been formed in science, they may be designated by arbitrary symbols, which may if necessary be universally accepted and understood. Hitherto such symbols have been mainly employed for reading, that is to say intended for the eye, and not for the voice and ear. For example, in different languages quite different sounds are assigned to the numerals, so that, whilst the written symbols are universally intelligible, the spoken ones are not.

However, there are a considerable number of exceptions to this statement. The word *integral* is quite as international as the symbol  $\int$  and the chemical symbol Tl is pronounced everywhere *thallium*, or something very like it. On looking through the table of the chemical



elements one finds that more than two-thirds of the names possess similar sounds in the chief languages. Differences occur only in the case of the well-known elements, where the words employed in daily[63] life have found their way into science, whilst the newly discovered elements all possess international names. It follows from this that the further problem of assigning an international system of sounds to scientific concepts has been in certain departments of science already approximately solved. It is true that the sound is still somewhat dependent on the speech basis of the particular nation, so that, for example, not inconsiderable deviations may occur in English. But, as the written and printed word is always simultaneously known, the recognition of a name as pronounced by a foreigner does not cause any very great difficulty.

There exists here a field of work for those who are interested in the idea of an artificial language which is as fertile as it is interesting. As is well known, we scientific men suffer a good deal from the fact that the same words are frequently employed for the vague ideas of daily life as well as for the perfectly definite concepts of science. This is indeed one of the most important reasons why new designations for scientific concepts should, as far as possible, be taken from the dead languages, such designations being thereby already international. It ought therefore to be a comparatively easy task to devise by means of this international material and the linguistic rules of the language of the Delegation a system of international names for the clearly defined concepts of the different sciences.

Such a system possesses a double purpose. In the first place, it could, I think, be used in our present natural languages. Certain English expressions occurring in electrotechnics, such as *shunt*, *extra current*, are employed in German and French just as if they were national words. The international names in their international form might be employed in every case where a precise scientific

terminology was required, without doing much violence to our natural languages. The inflow of foreign words through the channels of technology and science as well as those of [64] commerce and music has already shown itself to be irresistible, so that a strict carrying out of the principle of "purity" in our national languages has been a practical impossibility. In literature properly so called one will endeavour nevertheless to adhere to this principle, but where the chief question is one of precision of concepts, as in science, language must be regarded as a handmaiden, whose first duty is to obey. For language stands only in a secondary relationship to the independently developed and determined concepts of science, which have been already fixed by the symbols assigned to them, just in the same way that language has fixed the concepts of daily life.

Independent of the above application, which one may or may not consider practical, is the internationalisation of scientific publications by means of a universally understood auxiliary language, which is becoming every day more urgently necessary.

This problem, too, cannot be attacked until the concepts of all the sciences in question have received their proper designations. The existing dictionaries of international auxiliary languages contain mostly the expressions of daily life, so that at present these languages are mainly applicable only for such communications. Some success can indeed be obtained in the expression of the higher trains of thought of philosophical reasoning, but here already considerable uncertainty exists. It is clear, for instance, that a paper in organic chemistry can only be successfully written in the international language after the translations of the different names for substances occurring in different languages have been mutually agreed upon.

Consequently the working out of the concepts of the different sciences and the determination of their

international designations is the very first task which must be performed before the further objects, international literature and international oral intercourse in science, can be [65] considered. It is the duty therefore of the representatives of science who have joined the *Unione di l'Amiki di la Linguo Internaciona* to apply themselves in the first place to this problem, since the further success of the whole question depends entirely on its at least provisional solution.

The first principle which must guide this work is undoubtedly the general principle of maximum internationality, which has been used in the construction of the auxiliary language. Its application is rendered easy by the fact that, owing to the use of Greek and Latin roots for the designation of scientific concepts, there is already present a far-reaching internationality, which must naturally be retained.

In the second place, it will not always be possible to employ in science the same expressions that are used in ordinary speech, because the effect of the latter is to produce a blunting of the precise connotation of concepts; whilst science, on the other hand, requires clearly defined concepts, to which must correspond equally distinct expressions.

In the third place, those words which occur frequently in combinations must be chosen *as short as possible*. Here I would not shrink from a very considerable mutilation of the most international forms. Such long names as *wasserstoff* or "hydrogen" cannot be permitted, and must be reduced to monosyllabic forms. Every chemical author must have been times without number annoyed by the terms of three and four syllables for the commonest elements, and this defect is common to all languages. The objection against such an artificial abbreviation, which is valid for the language of daily life, namely, that it increases the difficulty of the language for those of little

education, does not hold in the case of science, since it is a matter of indifference to the beginner whether he learns the new name *oxygen* or *oxo* (or any other similar abbreviation), because in any case he must learn it by heart. Such a procedure satisfies also the [66] second condition, as it facilitates most easily the giving of a special form to scientific terms, which is different from that of ordinary life.

In the fourth place, it will be advisable in cases where universally known symbols exist, which consist of letters or have been derived from these (such as certain mathematical symbols), to choose the name so *that it begins with the same letter*. For example, the constant of gravitation is now universally denoted by *g*, and the corresponding international word should therefore begin with *G*. It appears to me doubtful, however, whether this principle can be generally carried out. I have examined the names of the chemical elements with this intent, and have arrived at the conclusion that it would not work without doing considerable violence to general usage. For example, it would be scarcely possible to find an international name for *chlor* (chlorine) which, corresponding to the chemical symbol *Cl*, would begin with *C*, for the latter letter is pronounced *ts*, whilst the word *chlor* (with corresponding terminations) is international, and, according to its sound, must be written like *kloro* or in some similar way.

These are the formal suggestions which I should like to make with reference to the problem in hand; they are only intended to indicate how one might proceed, and are not to be regarded as either exhaustive or infallible. There arises now the second question as to how such work is to be organised.

As the same concepts occur in several related sciences, and must receive the same designations, it would not be practicable to entrust the construction of the vocabularies

to special commissions for each particular science. It would be more advisable to appoint a certain number of persons to collect the material and to make out lists of the concepts for which terms are required, and then to appoint commissions representing a whole group of sciences to [67] discuss the necessary principles, after which the details could be worked out and finally subjected to the examination and approval of the whole body. To make matters at once more definite, I think the exact sciences ought to be first taken into consideration, for in their case the fixation of concepts is most highly developed. There is no need for a replacement of the well-known Latin nomenclature employed in the descriptive sciences, nor would any attempt in this direction have any likelihood of success. We must look rather to the distant future, when all other sciences will have already adapted themselves to the international idiom for the translation of the Latin names into the forms of the international language (retaining the stems, however) in order to produce for æsthetic reasons a uniform system throughout the whole of science.

On the other hand, I consider it absolutely necessary to subject the concepts of *logic* and the *theory of cognition* to the same process of scientific delimitation and fixation. In the first place, these sciences belong, at least theoretically, to the exact sciences; and, in the second place, work in these departments of knowledge is rendered extraordinarily difficult by the fact that their concepts are expressed in the terms used in daily life, whose elastic nature constantly frustrates exact work.

Conversely, this great process of purification cannot fail to bring to light much that is of value for the theory and systematisation of scientific concepts. For one must be quite clear on a subject oneself before one can make it clear to others. Indeed, even a simple classified list of possibilities, in which one has earnestly sought to omit nothing of importance, constitutes in itself a scientific

advance, which is rendered all the more desirable by the fact that in general people have troubled very little about questions of this sort. It may be already foreseen, and indeed with pleasure, that such problems are not to be solved offhand, and will[68] probably require for their final settlement an international congress, at which the final decisions will be made. For this congress will probably be the first scientific gathering at which, instead of three, four, or five languages, only one, and that the international auxiliary language, will be spoken.

WILHELM OSTWALD.

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[69]

## CHAPTER VII

### CONCLUSION: READING, WRITING, AND SPEAKING

Anyone who wishes to swim without the help of others is faced by a "vicious circle." In order to swim he must jump into the water, but before he entrusts himself to the water he ought to be able to swim. In spite of this, many people learn to swim without a teacher. How do they do that? They go at first only into shallow water, and splash about there until they have become more or less familiar with this element. Then, when they perceive that they can propel themselves in it, they go gradually into deeper water.

If we wish to get scientific men to use the international language, we must probably recommend the same method and advise them to move about in the shallower regions of every-day language before they venture into the deeper waters of science. The instruction concerning the

movements of swimming given by the swimming-master on dry land corresponds to a lesson of a couple of hours on the simple grammar of the international language. Further progress, leading up finally to the introduction of the latter into science, can be divided into three stages, which we may describe by the words reading, writing, and speaking.

I. *Reading*.—The extraordinary ease with which every educated person, and especially anyone who has learnt Latin or one of the Romance languages, can read and understand the language of the Delegation almost without any previous study, indicates that the first stage will not be difficult of [70] attainment. But one would require scientific reading material in order to gain practice in scientific reading, and there we are again faced by a vicious circle. For, in order to create such reading material, we require authors who can write it, and yet the latter can only learn to express themselves in the international language by means of already existing reading material. We must therefore at first make use of the language of daily life and carry over into science whatever is found to be suitable for scientific purposes, after which more sharply defined meanings may be assigned to the words. It has been indicated in the previous article how the remaining special scientific nomenclature can be determined. When this preliminary work is sufficiently advanced the following way will lead quickest to the goal.

There will be founded an *international journal*, divided into as many divisions as correspond to the groups of sciences to be dealt with. We have here in view more particularly the theoretical and practical sciences of nature, because they have much more urgent need of an international auxiliary language than the "humanities," whose representatives are more likely to possess a sufficient knowledge of languages. For example, mathematics, mathematical astronomy, mathematical geography, mathematical physics, geodesy, etc., might form one group; general and experimental physics,

chemistry and physical chemistry, electrotechnics and applied chemistry, mechanics and mechanical engineering, etc., a second group; mineralogy, petrography, crystallography, geology, etc., a third group; biology, systematic and physiological zoology and botany, morphology, etc., etc., a fourth group. Extensions of these groups and other modes of arrangement might of course be introduced.

The foundation at first of several separate periodicals would not be advisable.

The following remarks may be made concerning the[71] contents of this journal. In conformity with our plan, it should not at first contain any original articles, for the international language is not intended to replace the natural ones, but only to act as an *intermediary* between them. Besides, the journal must not contain any insignificant or uninteresting articles if it is to attract and interest readers. But eminent authors, even if they could command the international language, would not publish important original articles in a journal which naturally at first would not have any very great circulation.

The journal must therefore contain chiefly translations of interesting articles from all branches of science and from all languages, and also extracts from the more important literary productions. The editorial committee of this journal should be independent of the Language Academy, but nevertheless in close contact with it, in order, on the one hand, to guarantee the correctness of the language by means of the Academy, and, on the other hand, to help the latter by acting as its scientific adviser. The gradual dissemination of this periodical would have the effect that a considerable number of scientific men, especially those of the younger generation, would be induced to read and understand the international language without any expenditure of trouble injurious to their professional work.



II. *Writing*.—From reading a comparatively easy step leads to writing. The number of scientific men would soon increase who could either write directly in the international language, or, at all events, translate a paper written in a natural language into the international language. Owing to the gradually increasing dissemination of the international Review, a first-hand publication of such papers in the Review would soon be very much in the interest of the authors, as the acceptance of their papers would itself be a mark of honour, whilst the rapid distribution amongst all nations would be likewise advantageous.

[72]

III. *Speaking*.—The speaking of the international language at first in small and then gradually amongst wider circles and finally at international congresses can only be attempted later. This attempt must not, however, be made before its success is fully assured, and the language has received a certain amount of consolidation through its application to writing.

We have already remarked in another place that the introduction of the international language is not nearly so difficult as it appears at first sight, almost the only difficulty being the establishment of the *confidence* that this goal *can* be attained.

When one tries to swim for the first time it seems as if one would never succeed. But when, after a few lessons, one has seen one's comrades moving safely and merrily in the water, courage comes, and with it success. We shall therefore show in an appendix by means of an example that the language of the Delegation is already capable of expressing difficult passages with all possible fidelity.

At a time when the language had only just been fixed and when he had very little practice in its use, L. Couturat translated into it a particularly difficult passage from the work of Gomperz (the Viennese Academician) on *Grecian*

*Thinkers*. The present author, without having seen the original, retranslated it at Graz from the international language into German, and sent this to Gomperz at Vienna with the request, that he would give his opinion on the accuracy of the retranslated passage. Gomperz wrote characterising the reproduction as "astonishingly exact," "the test as extraordinarily successful, and the result in a high degree favourable to the possibility of employing the international language." This test must certainly be regarded as a very severe one, because the German language is foreign to the first translator, whilst, owing to its philosophical nature, the subject was not familiar to the second[73] translator as a physicist. For the sake of English readers, a similar experiment has just been made, the results of which are given in [Appendix III](#). A passage from Professor W. James's *Talks to Teachers on Psychology*, dealing with the laws of habit, was translated into Ido by Professor Couturat, and the Ido text retranslated into English by Mr. P. D. Hugon in London, who was unacquainted with the original. A comparison of the two English texts demonstrates the marvellous lucidity of Ido as a medium for the transmission of thought without distortion.

Two things are indispensable for the realisation of a great idea. In the first place, the idea must, as regards its nature and value, have a rational foundation, and its possibility must be demonstrated. In the second place, there must be present courage, energy, and persevering devotion in order to realise practically that which has been recognised to be right and good. No amount of energy, however great, can produce a lasting result from a mistaken idea; but at the same time nothing great has ever been accomplished by doubters and pessimists. The readers of our brochure will concede to us that the idea of an international auxiliary language and its realisation by means of the language of the Delegation have in the foregoing chapters been fully examined in the cold light of

reason and shown to be good and practicable, whilst the appendices will enable this opinion to be experimentally tested and confirmed. Now that the head has done its work, the heart, the source of courage and devotion, must do its part. We have full confidence, therefore, in calling upon the representatives of science, who have followed us so far, to assist us in the work, in the first place by *joining the Unione di l'Amiki di la Linguo Internaciona* and by making its labours known. This step can be taken also by those who do not see in the language as at present constituted the final and best solution of the problem, for before one can reach the topmost heights one<sup>[74]</sup> must traverse the intervening stages. We ourselves do not consider that our language is the best possible, but we regard it as one which is susceptible of continuous improvement without its immediate and future use being injured thereby.

LEOPOLD PFAUNDLER.