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[Dr. Alexander Gode]

## **THE PROBLEM OF FUNCTION AND STRUCTURE IN INTERLINGUA Dr. Alexander Gode**

The preparation of this paper was rather a tantalizing business. What seemed at first a fascinating, and clear-cut topic remained fascinating but became more and more involved. As the paper now stands, it is wide open and had better be called an invitation to further study than a study complete in itself. It consists of an attempt to clarify the question of function and structure in terms applicable to Interlingua followed by illustrative excursions and a summary of the practical implications of the approach used.

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The ideal machine is a system of perfect correlations of functions and structures. Every part of the ideal machine has its simple or complex, but in any event specific, function. If we consider that the full description of the individual parts of a machine should cover both its form and its location in the machine in working condition, then the parts catalogue of the ideal machine must be a simple key: look up a particular function and you will find the one corresponding part; look up a specific part and you will find the clearly circumscribed function it was designed and is destined to discharge. In a way such a parts catalogue might be called a dictionary of totally unambiguous entries for the translation of machine parts into parts' functions and vice versa.

The ideal organism, no less than the ideal machine, may be characterized as a system of perfect correlations of functions and structures. But the practical manifestations of this correlation are complicated by additional factors which do not obtain in the case of the machine. I cannot attempt to define these "additional factors," but I venture to suggest that they can all be construed as consequences, effects, or simply specialized aspects of the axiomatic datum that in an organism both the function and the structure of all the individual parts are labile and variable. It is probably possible to demonstrate that the truth of this assertion is operative only within strict type limits, but that is a question we shall set aside for the philosophers of biology to discuss. For the present context it is enough to observe that in an organism changed demands in function will be reacted to by complex structural readjustments while both slow and violent changes in structure may result in a striking redistribution of functions. As a result a descriptive parts catalogue in the organic realm may serve all sorts of useful purposes but can never assume the appearance of a simple, static, and reversible key of structures and functions.

The polarity of function and structure constitutes a most helpful frame of reference in the discussion of the subject matter of the most varied disciplines. It has a bearing on hematological research as on aeronautical engineering, on pharmacology as on structural linguistics.... It has a bearing on all these fields, though by no means the same in all

cases, as witness the contrast of its significance in mechanical versus organic entities worked out above.

As we apply the polarity of function and structure to language we cannot expect to emerge with a pattern of observations comparable in every respect to that obtaining in other domains. The Romantic conception of language as an organic growth is something we can tolerate today at best as an occasionally useful but always risky metaphor, yet the conception of language as an entity exhaustively describable as a tool or machine is likewise unsatisfactory and dangerous when we take it too literally, derive from it too naively literal conclusions

Here as elsewhere the question of the organic or mechanical nature of language is a little childish and possibly an atavism of the parlor game phase of our development when everything had to be animal, vegetable, or mineral.

Basically language is language and need not be further classified. Though it is perhaps permissible to think of it primarily as a medium of expression and hence physiognomonic in nature. If that is sound - and I think it is -- we have at least a reliable basis for rejecting the assumption that the structure-function relationship in language ought to be reducible to an unequivocal key.

There is a parallel here that deserves closer scrutiny. Perhaps I am sticking my neck out if I admit that to my mind phrenology, graphology, and physiognomonics in general deserve to be classed as potentially serious sciences. I am convinced that these branches of study would not enjoy today too ill-flavored a reputation if it were not for the accidental fact that the fathers of their modern tradition -- Messrs. Lavater, Gall, et al. -- were eighteenth-century minds in search of characterological keys.

Lavater's conception of physiognomonics is neatly, though perhaps a little unfairly, illustrated by the passage in which he insists that the flatness of the bed bug is a convincing manifestation of the creature's inability to love. Gall's catalogues of phrenology are equally mechanical in their keylike arrangement and so were until quite recently the atlases of the brain with their tendency to assign unequivocal nervous functions to specific cerebral structures. The theory of the immutable link of every individual nervous function with one specific structural unit in the brain has been badly shaken in our time through experiments with localized extirpations in pigeon brains, though we cannot over-emphasize the fact that the results of these experiments did not call for an outright rejection of the conception of a link between brain structure and nervous function but only for the recognition that in this particular field the link cannot be expressed in a simple keylike parts catalogue.

If I allude in this context also to the work of Ludwig Klages, who did more than anyone else to replace, in all the characterological disciplines in general and in graphology in particular, the conception of a mechanical correspondence of trait and significance, i.e. of structure and function, by a conception of labile correspondences expressive of tendencies rather than of facts, I think we have sufficient evidence to suspect that the

inclination to recognize function- structure correspondences as varied and complex is just as characteristic of our age as the endeavor to reduce these correspondences to a mechanical key was characteristic of Lavater's and Gall's age, perhaps of the entire nineteenth century and certainly of the eighteenth.

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This outline has significant bearings on the history of interlinguistics. In a certain, not as yet completely dispelled prejudiced attitude, the lumping of interlinguistics with graphology, phrenology, and the like seems quite natural. But the really essential point to be stressed here is that until quite recently and in some quarters even today the task of the interlinguist was and is construed as that of a linguistic tool designer who starts out with a clear-cut list of requirements of function and is done when he has devised for each such requirement an ideally efficient structural feature.

In its extreme form this approach yields nothing but ludicrously impracticable interlinguistic schemes or even sketchy outlines of projects of such schemes. But we are hardly interested in these caricatures of the idea that in designing an auxiliary language one should provide structural representation of previously recognized functions. In its serious manifestations the idea can be traced, I believe, in one uninterrupted continuity to Leibnitz and Descartes. It is clearly apparent in Esperanto and by no means absent from de Wahls Occidental.

Now obviously, the complete practical failure of interlinguistic systems built exclusively on the idea that we can establish an exhaustive list of linguistic functions which need but be equipped with corresponding structural devices in order to turn into a full- fledged language and also the suspicion that the representation of this same idea in systems like Esperanto and Occidental has hampered their progress, is not enough to condemn the idea as theoretically invalid.

If we could compile an exhaustive list of separate linguistic functions, the proposal to evolve from it a smoothly operating language by simply providing all the required structural parts would certainly seem appealing. The difficulty is precisely that the initial list of separate linguistic functions is not just hard to compile but is actually impossible. Language shares with organism the trait that the correspondence of function to structure is labile and variable; language shares this trait with organism not because it is (romantically speaking) an animate being with a life of its own but because in addition to being an expressive tool it is a physiognomonic manifestation of individual and social existents.

In all this there is nothing particularly puzzling except of course that by implication it seems to impute to Leibnitz and Descartes and their like-minded contemporaries a fairly naive conception of language. Anyone who has ever attempted an exhaustive description or definition of the function of even the simplest structural element in language -- let us say for instance of so "clear" and "plain" an item as the common occidental Latin suffix -al- will recall the creeping notion that possibly the difficulty lay not at all in his own

inadequate analytical powers but rather in the very character of the thing he was trying to cover by a logical statement. Is it conceivable that Leibnitz for instance failed to be aware of this situation I submit that it is inconceivable, and more than that: it is precisely this aspect of language that Leibnitz complained about and hoped to mend by his preoccupation with the problem of a philosophical language.

We may look at it this way: the motive in all interlinguistic endeavors of the past century or so has been to provide mankind with a common auxiliary language, a language that is, which could serve all of mankind as Latin once served all of the nations of the occident. In other words: if Latin in the closing decades of the nineteenth century had been as alive as it was four or five hundred years before, it most probably would never have occurred to Dr. Zamenhof to devise his Esperanto. Instead he would have advocated the universal teaching -- possibly in a simplified form -- of the existing international language, i.e. of Latin. At the time of Leibnitz the Latin situation was of course not yet half as bad as when Zamenhof did his work. And yet, to my knowledge Leibnitz did nothing to keep Latin alive and to revitalize it as a better-than-nothing answer to his quest for a universal language. Actually he did the exact opposite. By deed and example he promoted the use of the regional national languages to the detriment of Latin. For to Leibnitz' mind Latin as a universal language was just as bad as German or French, and if he had known Esperanto or Interlingua., he would not have liked them one whit better.

The argument for Leibnitz was not that the barriers of international communication must be overcome through the universal acceptance by all mankind of one common medium of communication whose identity does not matter very much as long as it is everywhere the same. The argument was that no existing language reflects absolute laws of thought flawlessly, that every language tends to falsify our thinking, that this deplorable state of affairs can only be rectified by the construction of a new language which does -- by definition and by construction -- reflect the universal laws of thought. Thus the term universal language comes to mean not a language which is universally serviceable as a medium of communication but a language which is universally valid as an instrument of thought.

The distinction of "medium of communication" and "instrument of thought" cannot be overstressed. The latter -- and only the latter -- seems to have been Leibnitz' interest. While I must consider myself totally unqualified to analyze this point further, it does seem quite clear that from this point of view there is no problematic relation of function and structure. Once the functions -- i.e. the universally valid elements and processes of logical thought have been clarified, their representation by this or that system of symbols is nothing but a question of technical convenience.

The tradition of Leibnitz' and his contemporaries' preoccupation with a universal philosophical language is continued in the recent past and the present not in interlinguistics but in symbolic logic and related endeavors.

This assertion will not go unchallenged. And actually it is not quite correct. For to the detriment of interlinguistics the Leibnitz type of quest for an absolute instrument of

thought was allowed to influence and sometimes to determine the interlinguist's conception of his task. It should not have been allowed to do so.

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The spell of the idea that interlinguistics is concerned with the definition of linguistic functions and the subsequent provision of efficient structural devices for their operation was totally discarded in the theory of Interlingua. It will be the task of the historian of interlinguistics to show that this event was the climax of an arduous development and cannot be accounted for as an act of creative inspiration on the part of the Interlingua theoretician. The only "creativity" for which these theoreticians claim credit is that they have not been creative at all.

In methodological terms this signifies that the linguistic system now in use under the name of Interlingua was codified on the basis of observed forms and never by a process of supplying forms for functions previously analyzed and judged to be desirable. In support of this observation I should like to review briefly some aspects of the procedures used in the elaboration of Interlingua

The fundamental work on the theory and methodology of Interlingua is unfortunately available only in typescript. It is a 500-page tome written in 1943 in collaboration with the research staff of the International Auxiliary Language Association by E. Clark Stillman and A. Gode-von Aesch and bears the significant title, "Interlinguistic Standardization, An Objective System for the Normalization of Internationally Current Word-Material Together With a Practical Plan for Its Elaboration Into a Complete Auxiliary Language."

I think the work keeps the promise of the title. It justifies the limitation of its field of research to Italian, Spanish-Portuguese, French, and English -- with Latin as a binding power in the background and German and Russian as occasional supplementary sources. It does so by elaborating the idea that these occidental languages may well be considered dialects of a common norm which five hundred years ago might have been identified with medieval Latin and which today must be precipitated from its half-existence into international terminologies of often world-wide validity especially in science and technology.

In this the salient point is the contention that a common standard is latently present and variously modified in the major languages of the Western World.

The task of the interlinguist on this basis turns out to be the search for an objective methodology whereby a visualized pan-Occidental Interlingua can be put down on paper. I may note here in passing that to my mind it is not possible to doubt the reality of the idea of Interlingua -- if this somewhat paradoxical formulation is permissible. It is only possible to attack the methodology employed in the codification of Interlingua and condemn it as inadequate. In other words, it is not possible to improve the visualized reality Interlingua by extrinsic additions; it is only possible to ask and search for more

refined devices which would permit the putting down on paper of a more perfect concrete likeness of the visualized idea.

As we look briefly at the methodology employed in the extraction of Interlingua we shall find--quite in keeping with the expectations aroused by the foregoing argumentation--that there is nowhere an instance of willful or arbitrary juggling of the relation of function and structure. This is quite apparent in the procedures used to compile a standardized vocabulary. Instead of following the interlinguistic tradition of assuming that it is possible to compile a list of concepts for which an international auxiliary language must provide forms, the theoreticians of Interlingua insisted that the first step had to be the parallelization -- on as complete a scale as possible -- of the vocabularies of the four source-language units. This was done by an exhaustive study of several thousand etymological families.

In culling from the resulting enormous files the words justly to be called international, the purpose of arriving ultimately at a realistic effigy of the visualized Interlingua was naturally the guiding principle. This required generally speaking the slighting of whatever could be called an accidental idiosyncrasy in one individual language. Hence a word was accepted as international if it occurred in all four language units but also if it was accidentally absent from one of them. The requirement of a word's occurring in three language units was so construed that either German or Russian could serve as substitutes.

In all this work the explicitly used definition of the term 'word' was a unit of form and meaning.' In determining the form under which a particular word was to be entered in the international vocabulary it was deemed necessary -- again in view of the ultimate purpose of this work -- to treat each item in the light of its derivatives.

To illustrate this very important point; from a strictly French point of view the word *vital* is not really a derivative from *vie* although both belong to the same etymological family. But in the international vocabulary the word corresponding to *vital* will have to appear as a derivative from the word corresponding to *vie*, and so one might say that the resulting Interlingua pair *vita-vital* reestablishes a continuity of form which has been disturbed in French, just as it has been disturbed in Spanish and Portuguese and is missing in English or German.

The Interlingua forms -- in the present case *vita* and *vital* -- follow the simple rule that all their correspondences in the contributing languages as well as all the direct derivatives must be evolvable from them by a repetition of the processes to which those correspondences owe their identity. That is, whatever process brought about the forms *vie* in French, *vida* in Spanish, etc., must be sufficient to explain their relation to the Interlingua form. In other words, the Interlingua form is the nearest common historical or theoretical ancestor of its variants in the contributing languages with the proviso that it must also suffice to explain the derivatives in the contributing languages.

The result of this method of "extracting" the Interlingua forms from the consensus of the contributing languages is in very many instances a most interesting revitalization of a

function-structure relationship which in the contributing languages appears to be blurred or completely disrupted. In its semantic value, or if we prefer, in its expressive functions the English term *vital* is a derivative from life. Furthermore, even without any sort of reference to other languages the term *vital* is formally a derivative built with the suffix *-al*. In English terms *vital* comes clearly from something else, but that something else is not there. The same can be said for German *vital*. In French and Spanish *vital* ought to come from *vie* and *vida*, but French has no suffix *-tal* and Spanish no suffix *-al* which changes a preceding *-d-* to *-t-*. In all these languages the form *vital* is a derivative from something potentially present just as the corresponding meaning is a derivative from something that does occur. In Interlingua this potential pattern turns out to be an actual one.

One might of course insist that in these matters Interlingua simply follows the model of Latin. In practice such a statement is entirely satisfactory, but in theory it is necessary to emphasize that Interlingua forms result from those found in any of the modern languages of the West under the influence of their derivatives in the same language and of their correspondences in the neighbor languages.

The next step in the Interlingua methodology had to be an attempt to round off the assembled international vocabulary in terms of practical requirements. This obviously could not simply consist in ascertaining that either the English or the French or the German vocabulary was adequately covered by the available Interlingua forms. The international vocabulary must be adequate to cover the internationally current body of concepts, and a major implication of the basic Interlingua tenets is after all precisely that the internationally current body of concepts constitutes a complete language.

Hence every concept -- regardless of whether it was conceived in English or in one of the other source languages had to qualify as international before its claim to representation in the international vocabulary could be acknowledged. This led to the striking observation that the international vocabulary already assembled on the basis of internationality of form was adequate on the whole in regard to abstract, scientific, and generally learned terms. The gaps appeared rather in the realm of everyday concepts of a totally concrete nature.

The problem here was not envisaged as amounting to the requirement of clarifying a given concept and of then providing for it a satisfactory term. It was rather construed as requiring the search for a new view point which would permit the established methodology to yield the forms wanted. For numerous concepts whose internationality could not be doubted this was achieved by simply taking into consideration older levels of the source languages, sometimes going straight back to Latin. More frequently it was done by examining and in a way by choosing among the various forms representing a given international concept in the source languages. For instance the concept represented in English by 'safety match' is clearly international, but its forms in the several source languages are totally divergent. Since we are here concerned with the problem of the elaboration of an internationally valid vocabulary, we might test the various source-language forms in their international potentialities. The Spanish *cerillas* might be

imitated in English as something like *waxlet* or in French as *cirette*, but neither of these could carry the required meaning even in context. Testing the other possibilities in a similar way one is bound to emerge with the conclusion that the Italian *fiammifero* has a fair degree of international expressive potency. In English it would appear as *flame-bearer* or simply as *lucifer*, which is quite excellent. But the more important point is that this term can be built into the already established international vocabulary by means of available elements. The Interlingua word for 'match' is *fiammifero*.

The interest of this example is again that the Interlingua methodology -- without assuming that it can "creatively" define a concept and then proceed to devise a word form for it - results in a clear correspondence of function and form which the contributing languages harbor only potentially or historically. The German *Feuerzeug* (which corresponds fairly closely to *fiammifero*) would not be a bad representation of 'match' and English 'lucifer' which is almost completely the same as *fiammifero*) got accidentally pushed into the background because its etymology is not kept alive by related popular terms.

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I have attempted to show that the question of function and structure in Interlingua cannot be posed autonomously. It will always present itself in terms of the same question posed in regard to the source languages. And yet the function-structure relationship in Interlingua is not the same as in French or in Spanish and Portuguese or in Italian or in English.

I have not solved, and have not attempted to solve, a problem. I have posed one. It is, reduced to the simplest statement I can devise: How does the complex of function-structure relations in Interlingua reflect the corresponding complexes obtaining in the several occidental languages and in what precise fashion is it a standardization of them?

The detailed analysis of this problem in all phases of Interlingua morphology and syntax and possibly also phonology and orthography is not a matter of purely theoretical interest. If the avowed purpose of this paper is to arouse someone better qualified than myself to undertake this study in great detail, I will admit that the ultimate goals I have in mind are highly realistic.

Interlingua claims to be a common denominator among the occidental languages. As a practical tool in the international dissemination of scientific and especially medical information it has justified that claim to a rather impressive extent. Yet this is only the first -- though probably the most immediate -- practical application of a common-denominator language.

A second phase would be its exploitation for the purposes of general-language instruction as also in the teaching of any one of the source languages involved in its extraction. In a teaching situation with let us say English as the start and French as the target language, Interlingua may function excellently as a third of comparison facilitating the recognition



of familiar patterns in the foreign ones since both would appear as modifications of the Interlingua standard. But a planned exploitation of this potential of Interlingua would of course be greatly enhanced by the availability of exact data on the comparative function-structure relationship in Interlingua and the ethnic languages involved.

This same prerequisite is considerably more urgent in another possible application of Interlingua which so far has received very little attention. Let me hark back for a moment to the very beginning of this paper: If languages were ideal mechanical tools with function-structure relations completely coverable by exhaustive keys, the theoretical preliminaries to translation by electronic computers would be a cut-and-dried affair. As I see it, the theoretical prerequisite of electronic translation is as easily stated as it is hard to fulfill. To be able to rig up the translation machine for perfect results, all that is needed is a perfect calibration of the function-structure patterns of the departure language against the function-structure patterns of the target language. The reason for the practical difficulties in this assignment has been variously alluded to in this paper. The patterns to be calibrated are not stable. They are as unstable and variable in Interlingua as they are in French or English or in any other language. But if we want to connect for instance French and English in an electronic-translation set-up, it seems sensible to suggest that the possibility of introducing a neutral intermediary of common-denominator qualifications should be investigated.

It is quite conceivable that research of the kind proposed in this paper will eventually bear fruit in the use of Interlingua as a half-way station in MT (as the experts have come to call the new field of mechanical translation by means of electronic computers). Instead of translating from German to English, one would translate from German to Interlingua and from Interlingua to English. Instead of having to calibrate German function-structure relations against those in French, those in French against those in English, and so forth in a criss-cross maze of connections of all sorts of language pairs, there would have to be only back-and-forth calibrations between each individual language and Interlingua.

To be sure, even if it can be demonstrated that Interlingua can function as efficiently in this assignment as it does in its present jobs, it may well be that this can no longer hold true when a language pair not comprising a Western language is to be connected by mechanical translation. But rendering Khirgiz texts in Korean or vice versa is probably not a very urgent matter.

And anyway if and when the time comes when the languages of the Western world are no longer of prime importance in most international affairs, Interlingua will no longer be around either. As a product and physiognomonic expression of Western civilization it seems fitting that it should perish with it -- or of course, survive with it and flourish.

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(Note: Dr. Gode died in 1970, but this was the address of his office in the 1950s and 1960s.)