Riproponiamo qui una lucida e compatta presentazione dell'approccio di Ceccato alla Linguistica. Il lavoro è del 1965 e venne pubblicato sul primo numero della rivista Foundation of Language.

Operational Linguistics[a]

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I

(1) There are various ways to orient linguistic studies. These depend, as they always do, on the scholar's object in making the study, on the range set for the study, on the resources available, and so on. As regards linguistic studies, we now have a new possibility, which until recently had escaped us but which now has been opened to research, both because of the new exigencies which linguistics is called upon to satisfy, and because of the results of a certain line of investigation on the activity of the mind. This choice, because of the new horizons which it lets us glimpse, seems destined to have remarkable developments even in fields which are not strictly linguistic.

In short, we have seen how the linguistic phenomenon can be studied: (A) as an already acquired product, or (B) in the activity which produces it; and how this activity in its turn can be studied: (B1) as a transformative physical activity, or (B2) as a constitutive mental activity.

Thus linguistics can take as its object either the already acquired linguistic product (whose variety is well known), or the transformative or the constitutive activity from which it results. And we have agreed that the object of operational linguistics must be the linguistic phenomenon in its constitutive activity.

(2) Before going on to the presentation of operational linguistics, we should like to clarify two points. We must make clear what the constitutive activity is, and how it is distinguished from the transformative activity; and we must pause for a moment to consider the reasons why it remained hidden and to consider the consequences which derive from it. This will permit us to define with precision the position of operational linguistics among the various lines which traditional linguistics has followed.

(3) It is certainly not a novelty that man performs two types of activity. People have always spoken of intellectual activities, activities of the mind, and of manual activities, activities of the arm. The chess player, for example, obviously performs both. He performs a mental activity when he perceives the chessboard and the pieces, or when he imagines them in the places which they will occupy when he has moved them. When he places the pieces on the board with his hand, when he moves the pieces, he performs a manual, a physical activity.

The two types of activity can be distinguished in a number of respects.

For example, the individualization and the analysis of mental activities are carried out directly on these activities, without encountering anything observational, whereas the individualization and analysis of physical activities encounter something observational in the organ, the subject, the instrument, etc.

Besides, when we speak of manual, or physical activities, we assume a preexisting material, and a subsisting product, things which are outside the activity, which are not contained in the activity, but which are beyond. it; whereas, in the case of mental activities, it is only a different way of seeing which leads us to articulate in them a material, a result, and the activity. Making bread dough precedes shaping the loaves, and the bread follows the shaping. But the situation is different if one thinks of a musical theme, of which, in fact, the isolated notes may be considered the material, their succession the activity, and the theme the result, but the one thing is unthinkable without the other. An activity such as that which constitutes the category of "all", composed of the category of "beginning" followed by that of "end", can be articulated assuming the latter two categories as its material, and the category of "all" as its result, with the combination of the two categories remaining to the activity; but, indeed, nothing preexists and nothing subsists with an independent existence.

Naturally, we individualize and analyze transformative activities by means of mental categories, to be precise, through perception and representation, categorization, thought, and so on; but these mental activities are the present only as an instrument, and not as an object.

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The difference between the transformative activity and the constitutive activity enters into the distinction between the mental disciplines and the naturalistic ones, whether physical or psychical, in that the latter use constitutive activities, but instrumentally, as they are interested in working on the results of repeated observation, in order to follow the behavior of an observatum or the relationships between the observata. (Let us note that, as a consequence of this, an observatum can be studied in two different ways, either by reducing it to its constitutive operations, losing it as an observatum in its constitutive elements, or in its history and relationships with other observata, where it remains present as an observatum.). Thus it is clear that operational linguistics is a mental discipline and not a naturalistic one; and that in operational linguistics designated things can and must be seen as the products of the constitutive activity alone, otherwise it would become psychology or physiology of language.

(4) The constitutive activity, and, therefore, the counterpart of words in terms of operations, had to remain hidden, leaving this facet of linguistics obscure and difficult to grasp, for reasons which go back to the first beginnings of speculation on the human mind. As is well known, this type of research began in Greece, in India, etc, when naturalistic research - whose point of departure, as we have seen, is the observata, the relationships between the results of more than one observation - had already been under way for millennia. In fact, in this way, the more immediate needs of life can be satisfied, that is, thus one can come to know that trees grow, that water puts out fire, that fire heats water, that certain stones broken in a certain way cut, and so on. When research on the mind was added to naturalistic research, it followed the same lines, and both were in the field of the "physiologoi". In short, in order always to work on things which have already been observed, it was supposed that man is surrounded by many things, already separated from each other and formed (that is, both he, as a body, an organism, his head, etc, and the things, as they result from observation), and that these things are present for him as a consequence of the operations with which he constitutes them, for example, through their reflecting themselves in him, by emitting particles, waves, or the like. Then, as there is no room for them in our body, which is already full of anatomical parts, after some attempts to receive them in the few empty spaces, the pores, the cavities of the ears, etc, the final solution was to double the things inside us in entities equal to the external things, but lacking their physicality, forming "abstract entities", thus no longer forming operations or observata (theory of the two substances, that is, of the mind and body, or spirit and matter, as two substances, with spirit defined negatively in relation to matter). And, when naturalism exerts pressure, with all its exclusivism, as physicalism, the doubling of the observatum is represented in the two terms of a cause and effect relationship, both of which are always observata; thus, aside from the fact that a vicious circle is formed, it is the transformative, and not the constitutive activity which is introduced.

It would be beyond the intent of this paper to trace out the innumerable consequences of this theory of knowing (as the spatial doubling of the objects of observation) in all the studies on the mind; surely, there is no discipline whose object is man which has not felt the effects of this theory, as have even the mathematical and physical disciplines, either when they were given their foundations or in order to enlarge the area of investigation to include the activities of the mathematician and physicist.

Linguistic studies as well felt its effects in their non-naturalistic part, and thus from the definition of language on: its difference from the single languages; as well as the comprehension of the designative values of the single languages; the distinction, which is possible and of which we have always been aware, between dictionary and grammar. On the other hand, studies in phonology and phonetics, linked with the physicality of the sounds used in designation, or even in glottology and philology, linked to words or texts as already acquired products, in which the constitutive activities appear only instrumentally, and not as the object, developed without difficulty. The greatest obstacle to the designative function characteristic of language arose from the attempt, completed on an ingenuous naturalistic, or pragmatic physicalistic basis, to attribute to each word or expression something designated of an observational type, giving rise to two orders or completely heterogeneous categories of words: those which designate particular observational things, or their constitutive or consecutive properties, and those which do not designate observational things and their properties, which in contradictory fashion lack a designatum, such as conjunctions, prepositions, articles, etc.

(5) The constitutive activity characteristic of the linguistic phenomenon can be studied according to two of its

aspects, which we can call vertical and horizontal.

We are introduced to the first by the very definition of language, which is the activity with which designative relationships are placed; to the second by the linking together of the terms of these relationships, in the formation of thought and of discourse.

In the designative relationship alone we already find together: (a) the designating thing; (b) the designated thing; and (c) the particular relationship which is placed between the two and which makes them such. Nothing in fact by itself is ever a designated thing or a designating thing; to prove this, it is sufficient to point out that a certain thing may become either one or the other although it remains unaltered in its detail: for example, the following figure, +, sometimes can be taken as the designation of a certain arithmetical operation, and other times as the thing designated by the word "cross".

When we speak of language, and not of a language, what interests Us most is this designative relationship: which consists in the passage from one thing to the other, and which is not symmetrical: otherwise we would no longer distinguish between the passage from designating things to designated things, or the moment of linguistic comprehension, of listening and reading, and the passage from designated things to designating things, or the moment of linguistic expression, of speaking and writing. When we listen or read, the thing from which we depart is left behind; when we talk or write, it is kept in mind.

The study of this designation relationship not only is fundamental for establishing the originality of language among other human activities, but also permits us to understand what the genesis of language may have been. At the beginning it is enough that a sound, an odor direct the attention to something else.

Each language however owes its individuality not to this designative structure which is common to all languages, but to the particular things which appear in it as designating things and as designated things, and to the connections with which they are bound to one another in that language. We find that Italian, English and German have a certain animal in common as a particular thing, that is, men who speak these languages perform in common certain perceptive, representative, categorial, etc, activities to which, respectively, the sound-marks "cane", "dog", "Hund" are made to correspond; and we find that German has a certain state of mind as a particular designated thing, to which the designating thing "Stimmung" corresponds, but this state of mind does not seem to appear among the English and Italian states of mind. The whole which consists of designating and designated things, and of the particular connections between them, constitutes a language, is its patrimony; and, in order to take note of it and to fix it, dictionaries and grammars are compiled (and we shall see how this task is divided between them).

Although the designative relationship can make anything at all a designating or designated thing, the choice is greatly conditioned by biological and economical or practical factors.

For example, the designating things may be obtained by using the material which is easiest to produce and to perceive, and therefore easiest for the person who performs the linguistic activity to communicate. And thus, sounds and gestures have been chosen, and when people sought to give a fixity, a permanence to words, the transformations which can be made in certain materials by marking them were chosen. Then, it is economical and practical to obtain great variety by means of the combination of a few elements; hence the introduction of the alphabet to the disadvantage of onomatopoeic and ideographic solutions.

As to the designated things, their range is indefinite; it extends to all that can be present, perceptions, representations, categories, spatial and temporal orders, and, so on to everything of which people speak and write, and to everything of which they will speak and write. However, the realization that designated things can be studied in terms of constitutive operations shows the limits of this freedom too.

There is a certain amount and kind of operating which represents the optimum for both biological and economic or practical reasons, The amount has to do with the length of the operating, that is, the operating which is present as a unit in order to give rise to a unit of designation. We make the operating of the various organs present to ourselves by means of the operating of the organ of attention, according to a play of attention, which not only makes this operating present to us, but also breaks it and joins it. Now, it seems that the length of one of these units

cannot exceed one or two seconds, without stopping every mental activity, as when we stare at a point and enter a state of light hypnosis. The units of designation will, therefore, be portions of operating of a duration of one-two seconds. And, besides, if they were very long, that is, if they corresponded to complex situations, it is improbable that the same ones would repeat themselves during our lifetime; this would have two negative consequences, that we should encounter always new, not yet designated things, which would have to be designated, and thus new linguistic conventions would have to be introduced, and that we would never, or almost never, make use of the conventions which had already been introduced. For example, it might be quite easy to meet a friend, Luigi, or someone sitting, or some crossed legs, or someone reading, etc, but we would be very unlikely to come across "Luigi sitting with his legs crossed reading a treatise on topology". If a relationship of designation had. been set between this whole situation and a particular sound or mark, the time and effort required for the task of proposing the new designation, of memorizing it, etc, would be wasted. In our operational flow, therefore, we make cuts, which break it up into many tiny pieces from which we make our units of designation. But which of them will be the preferred ones?

They will be the most frequent ones, at least until science begins to proceed toward more and more specialized fields. But among them we shall certainly And. water, earth, etc, that is, the names of our minerals, and then those of our most common animals, and so on. An example should clarify this situation. In Italian and in English we have words to indicate that something assumes a certain color, when the occurrence is common, that is, when the thing gets black, white, yellow or red: "blacken", "whiten", "yellow", "redden"; but not when the occurrence is rare, as in the case of violet and blue, when we must use the expressions "to become" or "to make something" violet or blue, etc. Naturally, the differences between various languages will not be few, both in the choice of portions of operating, and in the richness of the choice; and this depends on certain fundamental preferences on the part of those who speak the language, on their level of civilization, on their living conditions, and the like. However some units arise from very common, almost universal ways of directing the attention; in particular, that which terminates or closes a thing, subtracting it from time, and that which continues it, opens it in another, and follows it in time. Our languages designate two situations with, respectively, the two categories, noun and verb. On the other hand, the particular way of using attention which consists of presenting the unit of designation in not only compact, concrete, but also articulate form, and which enters into the so-called abstract nouns and which gives us, for example, not only "pear", but also "pearness", not only "point", but also "pointness", etc, appears only in some languages.

With single units of designation, then, we would not proceed beyond 1-2 seconds. But, with our mind we construct units of a much different size. This comes about through two other construction moduli: correlation and summarizing recall.

Let us describe them by pausing to consider the fragmentation, the cuts which are made with the attention in the How of constitutive operations. If in executing a cut the attention besides breaking the flow joins the two portions obtained back together, it acts as the suture between them as well.

Some examples will clarify what these cut-sutures consist in.

Let us suppose we want to articulate a flow of operations, in such a way as to make two things out of it, which come one after the other with an interval placed between them, without detaching the attention from the the first in order to direct it towards the second. With this attentional operating, with this attentional play, a particular relationship is established between the things which is designated in English with the word "and"; and which, then, is used both in order to describe a situation in which things follow one another in that way, and when our attention is directed in that way ("they gave me a shave and cut my hair"; "give me a shave and cut my hair"; etc.). Let us suppose instead that the same flow of operations be articulated in such a way as to make two things out of it which always follow each other with an interval placed between them, but that the attention be detached from the first in order to direct it toward the second. English designates this structure with the word "or". If we now wished to repeat the two attentional plays, but this time eliminating the interval between then>, we would have the two situations which the English language designates with the words "with" and "without". (And this is why, for example, if we say "bottle and cork", or "bottle with a cork", we imagine two situations which in a certain respect are the same, because

of the presence of the bottle and the cork, but which in another respect are opposite, in that in the first case the bottle and the cork are separated, distant, whereas in the second case they are united.). The attentional operating which is most common in these cut-sutures is constituted by simply holding on to the first thing isolated in the flow of operations. We can easily see that this operation is present if we make two things follow each other, first as if they were independent, each by itself, and then executing the operation of holding; for example, "cold.", "winter" would become "cold winter". According to what is added, the held thing is called "substance" and the word which designates it is a "substantive", a "subject", etc.

Each of these cut-sutures gives rise to two things which enter into a particular interrelation (the relation being considered as a third thing). This triadic structure is characterized, on the one hand, by the temporal location of the three elements, and, on the other, by the fact that two of its elements can be anything whatsoever, while the other, obviously, cannot be anything except one of the attentional cut-suture plays. Furthermore, this cut-suture will be found, so to speak, between the two things, and, to be precise, it is performed while the first thing remains present, and it remains present while the second. is performed:
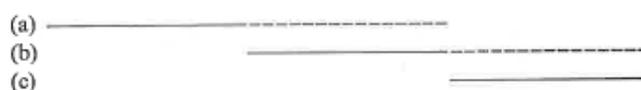
From this there results a dynamic structure, with three elements present at different times, in correspondence with the three different functions which they carry out in constituting it: that of first correlatum (a), of correlator (b), and of second correlatum (c).

"Beard and hair" and "beard or hair" are examples of this, but so are "Mario runs" (in which the attentional play consists of holding "Mario" while "runs" is added), "to run swiftly", etc.

The necessary presence of attentional play in every correlation as its correlator, distinguishes these relationships from those which subsist between physical or psychical things, and in which not the attentional operating, but that which one of these with its behavior is, or becomes, or does, with another, determines the relationship. Thus, in Luigi is holding Giovanni back", the "holding back" designates a physical or psychical relationship between Luigi and Giovanni, whereas the attentional play is that which intakes Luigi the subject and Giovanni the object of this activity of holding back.

Things of every sort can be correlata, including plays of attention, as when we say "And and or are relationships, plays of attention".

With the correlation we enter into the horizontal aspect of the linguistic phenomenon, into a Row in which we find correlation, in regard to the designated things, and the succession of words, or even the word, in regard to the designating things: two parts whose usual names, "thought" for the correlation, and "discourse" for the succession of words, are unequivocally recognized.

Thought and discourse, however, are rarely limited, at least in the adult, to a single correlation, but they surpass this unit of thought-discourse in more complex compositions. This comes about in that an entire correlation is used as an element of another, and so forth, giving rise to a net of correlations, or a correlational net. For example, in "whiskers and hair grow", we have the correlation, "whiskers and hair", used as the first correlatum of the large correlation which has "grow" as its second correlatum.

Thus, if we indicate the correlation with a graphic scheme like the following:

correlator	
I correlatum	II correlatum

the following correlational net will correspond to our sentence:
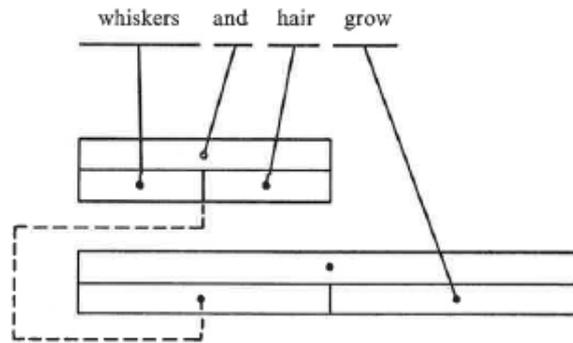
Even with this modulus of construction we cannot obtain units which exceed 5-6 seconds. Larger units of thought can be obtained through another construction modulus, which consists in taking up again what has been done, that is, what has been thought said, in condensed, summarizing form, a taking up which is usually designated through pronouns: "Whiskers and hair grow rapidly especially in the summer. They ....", but sometimes it is stimulated by the following thought content: "We are in the most expensive city in the world. A dinner comes to ...".

(6) The vertical and horizontal articulation of the linguistic phenomenon now shows what conditions are necessary for designation to take place, that is, for the order of thought contents on one hand and that of words on the other to be connected.

First of all a simple consideration will suffice. If we had to designate only one thing in the world, only one portion of operating, a single indication would be sufficient to ensure the designation; in that neither before nor after would we have anything, that is, it would be sufficient if, for example, a sound broke the silence, if a scribble stood out against a sheet of white paper. Thus, if we had to indicate a single musical note, the indication of that note on the line of the stave would be enough, without the indication of the time, with the relative bars, measures, and duration of the notes, etc. But, if there are two things to be designated, if there are two portions of operating, the corresponding two indications will no longer be sufficient, because we must also indicate the temporal order of their presence, and the length of time they are present. Thus, there must be four indications: two to indicate what particular things they are, and two to indicate in what order they are present, whether one after the other, or simultaneously, etc.; the number of indications can be reduced to three if, for example, it has already been agreed that they can only follow one another, so that, if we indicated that one was the first, or the second, the place of the other would be implicitly fixed.

Thus, however, we have also explained how thought and language are connected. In thought each thing, each portion of operating, each content, not only is a certain portion, but also occupies a certain place in relationship to all the others, performing a certain function in the correlational net. For example, "watches of a name-brand" and "a name-brand of watches" are correlations composed of the same elements, and the correlator is the same, but the situations which result are quite different since the order of the two correlata has been reversed. The single fixed structure of the correlation, however, permits us in designating it to save one of the six indications which would be otherwise required. for its three component elements, that is, three to indicate the three things put into correlation, and three to designate their places or correlational functions in constituting the correlation, because, once the three things and two of their functions have been indicated, the function of the third too is fixed. Each time a correlation acts as an element in a larger correlation, as a correlatum or correlator, an indication is necessary to fix, for all the elements of the first correlation, taking it as a unit, its new function.

The ancients who spoke of a naturalness of language perhaps perceived the characteristics of the linguistic phenomenon which we have described, and which underlie every language. The single languages, as we have mentioned, can follow their fancy only in the choice of the things to be designated, and in the things used. as things to designate, including plays of attention; but not in the characteristic structure of thought and language and their connection, without renouncing thinking, expressing and understanding.

Furthermore, all languages adopt two solutions for designation: the particular designating things, that is, the

particular sounds, marks, etc, used to designate, and the order of succession in which they are put. One thing does change, according to opposite preferences: some languages, such as Latin, Russian, etc, have more recourse to differences in the material used to designate; others, such as Chinese or even English have more to the order given the sounds or marks. The various languages show other preferences, although now they are more mixed, in keeping the various indications rather isolated, that is, one per word in the so-called isolating languages, Or else grouped. together in the so-called inflected and. agglutinative languages. The Italian language is very eclectic in this respect, for it permits one to say, for example, "ruba per me a lui quella cosa", and also, "rubameglielo", both of which mean "steal it from him for me".

(7) It would be illusory to expect that the two orders, thought and language, mirror each other, each with the same degree of articulation. Every language rises in fact both for the designation of thought and for its communication, but it rises in an environment of diffused knowledge, of common experience, which allow the language to do without a certain number of indications, in that these indications come from what everybody already knows. Above all, in certain languages, such as Italian, which inherits a freedom in stylistic construction from Latin, but which has lost the cases and one of the genders, recourse to what everybody already knows in order to supply the missing indications is ample and frequent. Nothing prevents an Italian from writing, for example, "La terra illumina il sole", and everybody understands that the subject is "il sole" although nothing in the sentence indicates it. And thus, if we come across the phrase "una quantità di acqua sporca", it might seem that every indication that "sporca" is the second correlatum of the correlation which has as a erst correlatum "acqua" is supplied, but we would have to change our mind on finding the phrase "una quantità di acqua piccola", because "piccola", and there can be no doubt about it thanks to what we know by other means, must refer to the "quantità" and not to the "acqua". Besides, in every language there are cases about which it would be impossible to make a decision because of a lack of explicit indications, if we could not supply them with our culture; it is enough to think of the expression of this type: "She is fifty and tall for a Frenchwoman", and "She is stout and tall for a Frenchwoman", where the words "for a Frenchwoman" the erst time act as the second correlatum of "tall", and the second time of "stout and tall" because we know that the age of a person does not vary with his nationality.

One of the new and extraordinary chapters in operational linguistics is that which has to do with examining how much and what kind of culture we need to understand a text in a univocal way.

(8) This distinction between the vertical and the horizontal aspects of the linguistic phenomenon is suggested in the one between dictionary and grammar, but only suggested, because in the latter there are several overlaps, reciprocal contamination, etc. In short, the dictionary could contain everything which has to do with designation in the vertical direction, that is, we have as entries the single units of designation, the elements of the correlation; the grammar could contain everything which has to do with designation in the horizontal direction, that is, the indication of the correlational functions. And in part, in fact, that is the way things are. But our grammars are also dedicated to a classificatory task permitted by the work on inflected and agglutinative languages, which consists in grouping into categories for example the words which indicate abstract and concrete things, material nouns, singulars, plurals, collectives, etc. As to dictionaries, besides giving a description of the things designated by the single words, they give the classification of these words made by the grammars.

It is a matter of distinctions which may well be revised by applying the knowledge gained through. operational linguistics just as, furthermore, literary and artistic textual criticism will benefit from it, as will poetry and rhetoric, and not least, logic.

II

(1) However, for now it is more important to apply the operational awareness which we have reached in order to outline the possible approaches to the linguistic phenomenon, by going back to our initial distinctions of the types of linguistic studies and amplifying them.

We think that a particularly harmonious and useful division is obtained by taking up singly and then combining

the alternatives offered by the study of the linguistic phenomenon when we consider it:

(A)	in language
(B)	in a particular language, and comparatively in the various languages
(Bl)	as an already acquired product
(B2)	in the activity that produces it
(B21)	in the transformative activity which produces it
(B22)	in the constitutive activity which produces it
(C)	turning the attention to designating things
(D)	turning the attention to designated things
(E)	turning the attention to designative connections
(CDE1)	directing this attention horizontally (thought and discourse)
(CDE2)	directing this attention vertically (single contents and designation units)
(F)	at present
(G)	historically.

Even if we stop the list of, alternatives at this point, they admit and allow us to glimpse both other alternatives, and subdivisions, and the broad combinatorial outline to which they give rise, and we can understand how operational linguistics is destined not only to add a new chapter to traditional linguistics, but also to offer a new dimension, both because of the internal awareness which it brings and the interdependencies it shows in the most classical chapters of traditional linguistics.

Without a conscious and programmatic partition it certainly is not to be expected that a discipline fit completely into one or another of the alternatives or into one of their combinations; in linguistics we note oscillations, dispersal, overlap, and omissions, where the tendencies, the customs established in history, rather than a declarable and declared boundary, predominate. (It is enough to think of the miscellany of subjects contained in grammars and books of logic.)

(2) The greatest lack and at the same time the greatest aspiration in linguistic studies, at least when they are not rigorously kept at a phonetic level, naturally concern individualization, analysis and description of designated things, that is, the correlational structures and the correlanda characteristic of thought.

In order for the linguistic phenomenon not to prove incomprehensible or downright contradictory, it is necessary that a designated counterpart be given to the whole discourse; and in order to be able to give an explanation of the "tout se tient" so clearly perceived by so many linguists in regard to language, it is necessary that this counterpart be found at a level of absolute homogeneity, whatever the distinction which will then be brought to bear on it (for example, the two orders of designated things, etc.).

Thus, if in traditional linguistics and in the various disciplines connected with the linguistic phenomenon, interests directed towards language and linguistic works, in a dynamic sense, have certainly not been lacking, it is a matter of interests very soon arrested and deviated, which have had to limit themselves to a transformative dynamism among observata and not to the constitutive dynamism of designated things.

We find, for example, the development of a word, of a rule, of a form, of a literary genre, studied by following the history of what has been observed, isolated history, or history of influences. We find a work studied in relationship to the author, taken more or less from an overall point of view, that is, in regard to that certain gentleman who writes, or in relationship to the environment, linguistic or otherwise, in which it appears, or the work in relationship to other works. We also find the use of a particular word studied at the recurrence of certain conditions described in naturalistic terms, conditions sought inside or outside the person who uses it, in the present, in the past, etc.

This is why the distinction between the two ways of considering the linguistic phenomenon, as an already acquired product or as production, and then the distinction between transformative and constitutive production, stopping to concentrate on the latter, has turned out to be so important that it is the distinctive trait of a kind of linguistics, operational linguistics.

Without being able to lay the foundation of individualization and analysis in the constitutive operations of designated things, the gaze of the linguist is forced to remain on the surface of language, without being able to follow the roots, either the roots of the word, vertically, or of discourse, in a horizontal direction. In order to get out of a certain overall dynamism, he then tries to describe his object through comparison, explaining what happens in one language with what happens in another; almost as if languages were born one from another, and not from thought, and for the thought which they communicate.

Besides, psychology, and to an even greater extent, physiology of language, have found themselves without the analytical premise from which to start. The psychologist and the physiologist, if not the philosopher, take as their object of study activities, because of the nature of their disciplines; hence thought is thinking and language is speaking. But they have been forced to end their dynamic aspirations at the designation pairs, assuming words as units and making them follow one another in blocks even with only the criterion of what comes before and what after, without more profound analytical investigations on the single designated things and without synthetic ones on their flow in thought.

As to psychiatry, we know how it has to work prevalently taking discourse as a whole fixing a certain normal linguistic behavior in an unsophisticated fashion, in comparison with which the interesting differences, the abnormalities, result. For example, we might have a normal genesis and development of language in the child, and in relationship to this we speak of retardations, of disturbances, of the various linguistic functions, connected or not with intellectual deficiencies; and thus we speak of aphasias, but even the subtlest analysis of them does not go beyond the superficial aspects of linguistic manifestation, limiting the analysis to the categorization of words on the part of traditional grammar, or to the formation of neologisms, metaphors, etc, in relationship to the current dictionary. Even the explanation of object recognition or of hallucination is kept on this level. The same limitation is encountered when the psychologist or psychiatrist goes to verbal, descriptive responses, solution to problems, etc.

From thought and its contents, that is, is taken what has come to the surface in linguistic expression, word and discourse; but from this it was impossible to get back to thought and its contents, in order to analyze them.

The insufficiencies of traditional linguistics have come to light in an even more drastic form when they have had. to reveal themselves as a result of the requirements of those who had a program of mechanizing linguistic activities, in particular in view of automatic translation, and automatic summarizing and information retrieval. In this case, in fact, theory did not follow practice, as comes about with men who speak - and every theory is good - but preceded it and the applications showed its correctness and completeness.

The impossibility of taking on a similar task would have emerged immediately if people had started out by wanting a machine which observes and describes, that is, a machine capable of passing from a non-linguistic situation to a linguistic one. The first efforts towards automatic translation were instead projects limited to the mechanization of a complex bilingual dictionary, that is, a dictionary compiled with all the input and output words of the languages in question; to which was then added the already made translation of whole groups of phrases, of entire sentences. But it was when, faced with the impossibility of proceeding with this solution they tried to apply to the machine some rules of traditional grammar, that it appeared, that the application of these rules presupposed a grammatical and logical analysis which, as we have seen, can only be partially effected when the comprehension of the text which is permitted. by our operational capacity and by our culture is missing. Nor could traditional linguistics, without taking up the problem of constitutive operating of designated things, dominate that situation to a point at which it could take the decisive step and escape from it.

As to automatic summary and information retrieval, it is clear that the illusion of obtaining reliable results by fixing lists of words to be kept and to be discarded and sifting a text with these lists could not last long.

These plans for mechanization can be realized, even if only with great difficulty, only if we propose as a first move a certain understanding of the text to be elaborated, that is, the reduction of discourse to the operations which constitute designated things; if not quite those of single thought contents, at least the correlational ones.

(3) The contribution with which an operational chapter in the sense now described. fills a gap in linguistics, we

repeat, is not only the usual enlargement which each new investigation brings to those in the same field, or even to others; it offers completely new openings to linguistic studies; and in particular two: the mechanization of linguistic activities and the study of the brain as the organ of thought and of language.

The importance of the two applications is easily understood.

Man by now lives a life which is indissolubly linked to language. His physical environment, first terrestrial and now cosmic as well, has become much larger, but this environment has reached dimensions at which man, if he is not helped by the machine, is destined to become lost among the hundreds of thousands of publications which come out every year in dozens of languages. The machine that translates, and even more the one that summarizes, classifies and locates documents, can be of great help.

Furthermore, as we have seen, without radically operational linguistics, the mechanization could not succeed, except with such limitations as would diminish the usefulness of the results.

To mechanize a description, which would include the entire operational chain from the constitution of the things to be described (i.e. whether they are perceptional, representative, categorial, etc.) to their combination in thought and their semantization, would be even less likely to succeed. This machine will be useful not so much for substituting man as he describes, in that he already possesses other instruments to bring nearer the events in his environment, and the rapidity with which they follow one another, although, it would perform a useful task by classifying perceived things when the latter are very numerous and must be classified according to many points of view; but the research and results required for its construction are the erst and necessary step in order to proceed towards the individualization and the analysis of the organic substratum of thought and its contents, whether this model of the human mind is actually constructed or not. We have seen that organs can be individualized only when the functions have been analyzed, and therefore it seems that this operational linguistic approach to the study of the brain cannot be eliminated, also because today it is still the most fertile and the most reliable in the study of thought.

Numerous other prospects are open, however, to applied linguistics of an operational type.

The new operational point of view effects the whole of general linguistics, and this new dimension cannot help but be reflected positively in the various particular linguistic disciplines, even those which use the already acquired product point of view, since it is a matter not of antithetical points of view, but rather of complementary ones, as in, furthermore, every other domain of knowledge. Undeniably, general linguistics must benefit from it both as an enrichment of awareness, and because the application of the results obtained constitutes a serious proof of it.

For example, all the traditional linguistic distinctions not only receive a second formulation, but also come to be inserted into a completely homogeneous classificatory system, which is flexible, and can be enlarged as much as one wants, in that it is no longer linked to the differences and equalities used in designation alone, or even to the differences and equalities which characterize the designated and designating things in a particular language. The fact that it overcomes these bounds can give rise to a system of reference, for classes and individuals, which is suitable for receiving any historically constituted language, whatever the designative patrimony of the language, and whichever the designative solution which it has adopted, that is, whether it is an isolating, agglutinative, or inflected language, etc. An analysis which, although it has arrived at thought and its contents through one or more particular languages, succeeds in articulating them in the subtlest way, frees itself from subjection to one language or the other, and thus offers results which are suitable for the new proposals. Thus it becomes reasonable to study eventual modifications to be made in a constituted language in order to make it more suitable for certain ends; or even to prepare an entirely new artificial language, in view of these ends, without leaving it, as has happened, up until now, parasitic on other natural languages which have not been sufficiently dominated. Thus, studies directed towards the interpretation of writing in code, that is, cryptography, should benefit; in that the alteration brought about in the order of things used as designating things cannot alter that of things used as designata, without destroying the comprehensibility and hence the communication of the text; and for the same reasons, studies of languages which have not yet been understood, and the interpretation and reconstruction of damaged texts will benefit even more.

The horizon opened in linguistic studies in an historical direction regards, principally, the possibility of follow-

ing the changes not only in the order of designating things, but also in that of designated things, it too reduced to history, through the operating of single individuals, and thus subtracted from a transcendent conception, independent of man.

Besides these constructive contributions, applied linguistics cannot fail to make a certain critical contribution as well, in regard to certain sectors of traditional linguistics and also to studies which have the mind as their object.

When linguistic activity is studied in view of its mechanization, in addition to adopting the new operational point of view, it is necessary in fact to satisfy certain conditions which have not always been satisfied in the study of language and thought, although the need of doing so has always been felt. In fact, we must succeed in describing designated things, thought and its contents in terms of constitutive operations such that they can be executed by organs which we can construct with our technology; but in order to effect this construction, the description must not contain any expression which is irreducibly metaphorical or irreducibly negative, that is, the description must come about in exclusively proper and positive terms, since nothing can be left to the judgment of the builder. This, however, is the contrary of what has of necessity happened when the human mind has been described more as a collection of "abstract entities" and of the relationships of the latter with observata and each other, than as collection of activities constitutive of things; and which of necessity has been transferred into linguistic studies, in the definitions of a certain number of the entries in the dictionary and, above all, in the definitions of, introductions to, and comments on the distinctions used in the grammars. It is a matter, therefore, of linguistic domains which will certainly have to be revised.

From this will come, however, a decisively constructive contribution in the first place to mend the famous break between humanism and technology, between the sciences of the spirit and sciences of nature, in that, if in part it may depend on different attitudes, it must today depend on the irreconcilability of the expressions which characterize the study of language and thought, that is, of the mental, and of those which characterize the study of observata, of the physical and also of the psychical. It is not a matter of identifying the two fields, but of ending the common homogeneous ground into which both send their roots. This ground is constituted by the constitutive operating of which both are equally results, even if in one case the operations do not constitute observata, or constitute one single perceived or represented thing, and in the other they constitute by means of the plurality of perceptions and representations whose results are put in relationship the well-known situations of the naturalistic sciences.

It goes without saying that when a thing is reduced to operations, to the operations executed in those moments, it is ready to be studied quantitatively and hence to be formulated mathematically. Because of this, operational linguistics can be considered the indispensable premise for every mathematical or quantitative linguistics. Otherwise we run the risk of measuring and counting we do not know quite what.

Notizie

*   In "Il Segnale", n. 95, Felice Accame ha pubblicato **Messaggi al grosso**