Structuralism in Modern Linguistics

Ernst A. Cassirer

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In the great family of human knowledge linguistics is one of the youngest members. Grammatical questions have always been studied with keen interest both by linguists and by philosophers. They can be traced back to Pāṇini’s Sanskrit grammar and to those Greek scholars who, in the fifth century B.C., laid the foundations for a scientific treatment of grammar and rhetoric. Yet all this was suddenly eclipsed by the new form of linguistics that developed in the first half of the nineteenth century. In the whole history of science there is perhaps no more fascinating chapter than the rise of the “new science” of linguistics. In its importance it may very well be compared to the new science of Galileo which, in the seventeenth century, changed our whole concept of the physical world. There is, however, one great difference between the two phenomena. When studying Galileo’s dynamics, we are under the impression that its genesis may be compared to the legend of the birth of the goddess Athene. It is, in a sense, ready from the first beginning; it leaps, in full armor, out of the head of its father. To be sure, there were still many and great progresses to be made; but these progresses concerned the results much more than the method of the new science. With linguistics it was different. Its progress was rapid and astounding. One discovery followed the other. The greatest things were done in a few decades; the greatest names stand side by side. But as regards its method, linguistics was not in the same favorable condition as natural science. It could not follow the example of modern physics which, to use the terms of Kant, had entered upon the safe way and the sure method of a science by a sort of intellectual revolution. It had to grope its way; it had to proceed hesitatingly and tentatively. It was natural that, in these first attempts, linguists looked for the help and guidance of other branches of knowledge that, long before, had established their methods and principles. History, physics, psychology

† Professor Cassirer died very suddenly a few days after delivering this lecture which was read before the Linguistic Circle of New York on February 10th, 1945.
could be used for this purpose. The thesis that linguistics is a historical science was generally accepted. But history alone is not enough. As Herman Paul pointed out in his *Prinzipien der Sprachgeschichte* (5th ed., Halle, 1920), every branch of historical knowledge is in need of a systematic complement and counterpart. Where was this counterpart to be found? Some Neo-Grammarians had sought for it in mechanics and physics. On the other hand, Paul emphasized that human speech is a mental phenomenon; and that we cannot hope to penetrate into its nature as long as we depend on mere physical methods. Psychology, not physics, is the true "Prinzipienwissenschaft"; it is only by the help of psychology that we can build up a coherent and systematic theory of language.

The physicalism of the first Neo-Grammarians and Paul's psychologism seem to be two divergent methodological attitudes. This divergence had, however, no decisive influence upon the general course of linguistic studies in the second half of the nineteenth century. In their answers to the question of the character of human speech, scholars like Osthoff, Brugmann, and Paul were not opposed to each other. In some fundamental points there was still complete agreement. That is easily to be accounted for if we bear in mind the general tendency of physics and psychology in the nineteenth century. The Neo-Grammarians had formed their ideals of scientific method according to the great model of classical physics. Physics seemed to have found its definitive form in Newton's *Philosophiae naturalis principia mathematica* and in Lagrange's *Mécanique analytique*. It was generally acknowledged that in the study of every complex phenomenon we must begin with reducing it to a mechanical phenomenon. And mechanics itself was conceived as "Punkt-Mechanik"; as the study of the movements of material points. In psychology we find the same trend of thought. Most of the linguists who recommended and used psychological methods were deeply influenced by Herbart. It had been the ambition of Herbart to create a new type of psychology—a mathematical psychology. This was possible only by following the examples of Newton and Lagrange. To reduce all psychological activities to what he called "die Mechanik des Vorstellungslebens" was one of the principal aims of Herbart. We find the same view not only in Paul's work, but also in other linguists of the same period. In H. Steinthal's *Einleitung in die Philosophie der
Sprachwissenschaft (Berlin, 1871) Herbart’s theory of apperception was made the cornerstone of general linguistics.

All this became, however, highly questionable as soon as physics and psychology began to see their own problems in a new light. In both fields it was not easy to break the power of the classical tradition. Eminent physicists of the nineteenth century, like Sir William Thomson, still declared that to understand a physical phenomenon means the same as to construct a mechanical model of the phenomenon. But these descriptions became more and more intricate. Innumerable and tremendous efforts were made to give a mechanical model of the ether — the supposed medium for the transmission of light-waves and electro-magnetic waves. But all these attempts were doomed to failure. The ether became, to put it in the words of Max Planck, “das Schmerzenskind der mechanischen Physik.” The solution came from quite a different side. The hope to explain electro-magnetic phenomena in terms of matter had failed; but it was perhaps possible to change the whole problem: to define matter in terms of electricity. In this case, physics could, however, no longer be described as the study of the movements of material points. The electro-magnetic field — in the sense of Faraday and Maxwell — is no aggregate of material points. We may, and must, indeed, speak of parts of the field; but these parts have no separate existence. The electron is, to use the term of Hermann Weyl, no element of the field; it is, rather, an outgrowth of the field (“eine Ausgeburt des Felds”). It is embedded in the field and exists only under the general structural conditions of the field. An electron is nothing but a part in which the electro-magnetic energy is condensed and assumes a peculiar strength. In the development of psychology we meet with the same tendency of thought. According to Hume or Mach, there was no other way to understand a complex psychic phenomenon than to disintegrate it into its first elements; into simple sense-data. Even our self, our personality, is nothing but a “bundle of perceptions”. In modern “Gestalt-Psychology” all this was transposed into its very opposite. Psychical phenomena — it was declared — have a definite structure; and it is impossible to understand this structure by treating it as a loose conglomerate — a mere mosaic of sense-data.

I need not dwell here upon these well-known problems. But from a philosophical point of view we have to raise another question. What had become of the logical aspect of human speech?
Strange as it may sound, it was precisely the great and incomparable progress of linguistic studies that, in the nineteenth century, had led to an almost complete neglect of this aspect. The pioneers of modern linguistics had attained their great results by historical methods. The founders of the comparative grammar of German languages and Indo-European languages—Jacob Grimm, Rask, Bopp, Pott, Schleicher—seemed to have proved by their example that the historical approach to human speech is the only scientific approach. The historical interest was so predominant that it completely overshadowed the logical interest. To be sure, there were still many linguists who insisted upon the rational character of human speech. F. Max Müller wrote two books: the one entitled *The Science of Language* (2 vols., London, 1862-64), the other entitled *The Science of Thought* (2 vols., New York, 1887). Both of them tried to prove the same thesis: the thesis of the fundamental identity of speech and thought. Reason, declared Max Müller, cannot become real without speech. Like the other works of Max Müller, these two books enjoyed a great popular success, but on the general course of linguistic studies they had very little influence. Their defects were obvious. They were full of arbitrary assumptions and fantastic constructions. W. D. Whitney wrote a special essay, *Max Müller and the Science of Language* (New York, 1892), in which he gave a crushing criticism of Müller’s theory. Max Müller’s expressions—he said—though sometimes betraying an inkling of the truth, are confused, indistinct, and inconsistent; they have no scientific value.

A work like that of Max Müller was, therefore, not likely to revivify and to strengthen the logical interest in human speech. But the spell was suddenly broken from another side. In 1900 Edmund Husserl published at Halle the first volume of his *Logische Untersuchungen* (3d ed., 1922). This work gave a new and powerful impulse to the study of logic. What had become of logic in the first half of the nineteenth century? One of the standard works of this period was the work of John Stuart Mill. Mill started from the presupposition that logic, if it is a science at all, must be an empirical science. Like all other laws, logical laws can be reached only by inductive generalization. Logic cannot indulge in fruitless scholastic discussions about the “forms” of thought; it has to analyze the facts of thought. Like all other facts, these facts are variable. It is, therefore, useless to speak of universal laws of
thought. What we call "truth" can never be more than the mental reproduction of our physical environment. A man living on Sirius or any other remote fixed star would have a truth far different from our earthly truth—he would not develop the same logic, the same geometry and arithmetic as we do.

All this was vigorously attacked by Husserl. As he pointed out, logical truth is formal, not material, truth. It does not depend on special empirical conditions, it is universal and necessary. The process of empirical generalization can never lead us to an insight into the pure forms of thought. An inductive logic in the sense of John Stuart Mill was declared by Husserl to be a wooden iron—a contradiction in terms. In the philosophical world Husserl's work had the effect of a great thunderstorm. It dispelled the clouds and clarified the whole intellectual atmosphere. I need not enter here on the long and vehement struggles between "formalists" and "psychologists" that followed the publication of Husserl's book. But what was the role of linguistics in this conflict? The decision was by no means easy. The linguist seemed to be caught on the horns of a difficult dilemma. He could not desert the cause of logic. Since the times of the Greeks there was always a sort of solidarity, of open or hidden alliance between grammar and logic. On the other hand, there was no doubt that linguistics could not do without the help of psychology or even of psychopathology. Recent research in the field of psychopathology of language—the study of aphasia and kindred disorders of speech—has done very much to clarify our concepts of the general function of speech. The sharp scalpel of Husserl's analysis had suddenly cut off all connections and communications between logic and psychology. But without these communications, without a constant cooperation of the logician and the psychologist, it was extremely difficult to build up a coherent theory of language.

We can perhaps best illustrate this point by referring to the general theory of truth that had been developed by the great rationalistic thinkers. Leibniz made a sharp distinction between two different kinds of truth. There is a formal or logical and an empirical or factual truth. Logical truth is eternal and inviolable; factual truth is changeable and modifiable. When dealing with facts, with phenomena in space and time, we cannot hope to find a necessary connection. Necessary connection is restricted to the ideal world—to logic, arithmetic, algebra, geometry. In all
other fields — in physics, astronomy, history — we cannot reach more than a contingent truth. If from the logical or formal sphere — the sphere of the possible — we pass to the empirical sphere, to the actual world, we have to change our standards. The “vérités de fait” are not of the same type as the “vérités de raison”; the “vérités contingentes” are incommensurable with the “vérités nécessaires”.

If we accept this clear-cut division between “vérités de raison” and “vérités de fait” — what is the role of linguistics? Can we deny that what we are studying in linguistics are facts — and nothing but facts? No language can be constructed in an a priori way. Whatever we know of a language we know from empirical sources — from our usual methods of descriptive or historical analysis. Can such an analysis give us more than “vérités contingentes”? This question became one of the starting-points of modern linguistic structuralism. The new movement started with a great paradox. It contained a certain revaluation of our former logical and epistemological value. If the adherents and defenders of the program of linguistic structuralism are right, then we must say that in the realm of language there is no opposition between what is “formal” and what is merely “factual.”

"Dans un état de langue donne, says Viggo Brøndal, “tout est systématique; une langue quelconque est constituée par des ensembles où tout se tient: systèmes des sons (ou phonèmes), systèmes de formes et de mots (morphèmes et sémantèmes). Qui dit système dit ensemble cohérent: si tout se tient, chaque terme doit dépendre de l’autre. Or on voudrait connaître les modalités de cette cohérence, les degrés possibles et variables de cette dépendance mutuelle. en d’autres termes, il faudrait étudier les conditions de la structure linguistique, distinguer dans les systèmes phonologiques et morphologiques ce qui est possible de ce qui est impossible, le contingent du nécessaire.”

The same conviction appears in Saussure’s *Cours de linguistique générale*” (2d ed., Geneva, 1922), in the works of Trubetzkoy, of Roman Jakobson, and of the other members of the “Cercle Linguistique de Prague”. Obviously the necessity which is claimed here for a linguistic system has no metaphysical connotation. It is

no absolute but a relative or hypothetical necessity. Roman Jakobson has expressed the character of this necessity by the formulæ:

1. si a existe, b existe aussi  
2. si a existe, b manque  
3. si a manque, b manque aussi.

"Ces rapports," he says, "qui ont infailliblement valeur de loi constituent un des facteurs les plus importants des changements phonologiques."

When speaking about these things to linguists I must, however, be prepared for the objection that what I am doing here means "to carry coals to Newcastle." Let me, therefore, try another and more indirect approach to the problem which I wish to treat in this paper. The term "morphology" is now quite familiar to us. But who was the first to use this term? It is perhaps worth notice that this term, which has now become an integral part of our scientific terminology — of biological as well as of linguistic terminology — was not introduced by a scientist, but by a great poet. Goethe used the word "morphology" as a general title for his doctrine of the metamorphosis of plants and for his studies in comparative anatomy. The first pupils of Darwin in Germany, especially Ernst Haeckel, often credited Goethe with being the precursor of Darwin. This is, however, a very inadequate and superficial description of his theory. When Goethe spoke of morphology — of "Bildung und Umbildung organischer Naturen" — he meant something far different from and even incompatible with Darwinism. Darwin saw the first impulse to the origin of new species in accidental or fluctuating variations. These variations are made at random; they have no definite direction. But they are enough to explain the whole variety of organic forms.

That was the real problem of Darwinism: to make conceivable how forms could arise from the formless, how a definite structure could be brought into being by mere accidental variations of an amorphous material. But in Goethe's theory we find neither the one nor the other. Metamorphosis, in Goethe's sense, does not change one organic type into another; it leads only to new formations within the same type.

Goethe did not stand alone in this concept of the organic world. His theory of metamorphosis was rich in new and original ideas. In order to defend these ideas he had to challenge the greatest scientific thinkers of his age. In the famous controversy between Cuvier and Geoffroy de Saint-Hilaire he passionately sided with the latter. But his polemics with Cuvier are not to be compared with what we find in the polemical part of his *Farbenlehre*.

Between Goethe's *Farbenlehre* and Newton's *Optics* there was a far-yawning gulf. No compromise and no conciliation between the two adversaries was possible. With Cuvier it was quite different. Cuvier advocated a static view of organic nature; Goethe, a genetic or dynamic view. The former laid the stress upon the constancy, the latter on the modifiability, of organic types. Yet, when going into the details of their discussion, we find that Goethe, even in his genetic views, was much nearer to Cuvier than to Darwin. In his *Geschichte der biologischen Theorien* (Berlin, 1905-09), Emanuel Radl describes the biology of Goethe, of Cuvier, and of Geoffroy de Saint-Hilaire as a "morphological idealism." That seems to me to be a very good and happy term. It expresses the common basis that remained unshaken in the controversy. Cuvier, Goethe, and Geoffroy de Saint-Hilaire were unanimous in emphasizing that there are no mere accidental things in an organism. If we have found one of its characteristics, we have all the others; we can reconstruct the organism in its entirety.

"C'est dans cette dépendance mutuelle des fonctions," says Cuvier, "et dans ce secours qu'elles se prêtent réciproquement, que sont fondées les lois qui déterminent les rapports de leurs organes, et qui sont d'une nécessité égale à celle des lois métaphysiques et mathématiques." 4

This principle became the corner-stone of Cuvier's whole theory. He was not only the founder of our modern comparative anatomy, but also of our scientific paleontology; and without his general methodological principle he could not have performed his task as a paleontologist. In paleontology we study the form of extinct

organisms. This form is not accessible to immediate observation. What is left to us are only scanty remnants, the scattered fragments of a living organism. Nevertheless, the naturalist is able to build up out of these scattered limbs the whole body of an animal. Give me the feather of a bird of an unknown and extinct species, said Cuvier, and I shall describe to you its whole structure; I shall, for instance, tell you the character of its skeleton. How is this possible? How can we use in biology, an inductive or empirical science, a deductive method? Let us hear Cuvier's own answer to this question.

"Heureusement l'anatomie comparée possède un principe, qui, bien développé, est capable de faire évanouir tous les embarras: c'est celui de la corrélation des formes dans les êtres organisés, au moyen duquel chaque sorte d'être pourrait, à la rigueur, être connue par chaque fragment de chacune de ses parties. Tout être organisé forme un ensemble, un système unique et clos, dont les parties se correspondent mutuellement, et concourent à la même action définitive par une réaction réciproque. Aucune de ces parties ne peut changer sans que les autres changent aussi; et par conséquent chacune d'elles prise séparément, indique et donne toutes les autres... La forme de la dent entraîne la forme du condyle, celle de l'omoplate, celle des ongles... De même l'ongle l'omoplate, le condyle, le fémur, et tous les autres os pris chacun séparément, donnent la dent ou se donnent réciproquement; et en commençant par chacun d'eux celui qui posséderait rationellement les lois de l'économie organique, pourrait refaire tout l'animal."

I have quoted this passage at some length, for, I think, we may use it for making a very interesting mental experiment, we may exchange every biological term of Cuvier for a linguistic term. In this case we should have, before our very eyes, the program of modern linguistic structuralism. Of course, the subject-matter of Cuvier is very different from that of the linguist, but what matters here are not the objects that are studied in biology and linguistics, but the connections and relations which we can ascertain between these objects. As to these relations, they show us the same characteristic form.

"Chaque fait linguistique," says A. Meillet, "fait partie d'un ensemble où tout se tient. Il ne faut pas rapprocher un fait de détail d'un autre fait de détail, mais un système linguistique d'un autre système." “Dans l'état de

vie," says Cuvier, "les organes ne sont pas simplement rapprochés, mais ils s'agissent les uns sur les autres, et concourent tous ensemble à un but commun. D’après cela les modifications de l’un d’eux exercent une influence sur celles de tous les autres. Celles de ces modifications qui ne peuvent point exister ensemble, s’excluent réciproquement, tandis qu’autres s’appellent pour ainsi dire, et cela non seulement dans les organes qui sont d’entre eux dans un rapport immédiat, mais encore dans ceux qui paraissent, au premier coup d’œil, les plus éloignés et les plus indépendents."

But here I must be prepared for a serious objection. Structuralism is one of the most characteristic tendencies in modern linguistic thought. Is it possible to compare such a tendency to those scientific ideals that prevailed about one hundred and fifty years ago? To be sure, Cuvier was one of the greatest naturalists. But has not modern biology outgrown his methods; have not his ideas become antiquated? Most, if not all, of the biologists of the second half of the nineteenth century were apt to answer this question in the affirmative. The champions and hotspurs of Darwinism often spoke of Cuvier’s work with a certain disdain. They could not forgive him his criticism of the theory of Lamarck and other systems of transformism. They charged him with having obstructed the progress of biological thought. But this was a very unjust judgment that had to be revised and corrected. Our modern historians of biology speak and judge in quite a different vein. Cuvier, says Emanuel Rádl, has not only discovered new facts and he has not only developed new and very important theories. His greatest merit lies in the fact that he was one of the first to cultivate the logic of science. He was more than a great biologist; among the moderns he was the first who examined the principles of exact science.⁶

This judgment of a historian of biology was, later on, confirmed by the systematic development of biological thought. This development did not lead to a denial or reversal of the theory of evolution. Yet the whole problem of evolution was restated; the character and the cause of evolution were explained in a way far different from early Darwinism.⁷ The program of this new biological movement

⁶ A. Meillet, La Méthode comparative en linguistique historique (Oslo, 1925), p. 12; Cuvier, Leçons d’anatomie comparée, p. 49.
⁷ Rádl, op. cit., l. 206 sqq.
was developed and explained by the English physiologist J. B. S. Haldane in a Presidential Address to the Physiological Section of the British Association in Dublin (1908). Haldane suggested for this movement the name “holism”; others preferred to call it “organicism.” To my mind, this new holism or organicism bears a close relationship to linguistic structuralism; the methodological views and ideals that we find on both sides are very much akin. But I cannot enter here into a discussion of this point; I must content myself with referring to the literature on the subject: for instance to Ludwig v. Bertalanffy’s *Theoretische Biologie* (i, Berlin, 1932) and to Adolf Meyer’s *Ideen und Ideale der biologischen Erkenntnis.*

When drawing a parallel between the method of linguistics and the method of biology, I wish, however, not to be misunderstood. We must be on our guard against a mistake that threatens to obscure our problem and to confuse our ideas. When dealing with linguistic questions, the philosopher and the logician are, from the very beginning, confronted with two great and puzzling questions. The first is, Is language an organism?; the second, Is linguistics a natural science or is it a “Geisteswissenschaft”? Let us begin with the first question. The comparison of language with an organism is very old. It has especially appealed to all romantic writers. But before giving a definite answer we must first explain what the simile means and what it does not mean. We may understand the term “organism” in an ontological or in a formal or methodological sense. In the first case, we are immediately involved in the most intricate metaphysical questions. In 1863 August Schleicher published at Weimar his book *Die Darwinische Theorie und die Sprachwissenschaft.* What we find here is a strange mixture of naturalism and mysticism. It is a romantic theory based on Darwinian principles. Human language is described as a living being; it springs up and fades away; it has its hour of birth and its hour of death.

“Languages,” said Schleicher, “are natural organisms which, without being determinable by the will of man, grew and developed in accordance with

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fixed laws, and then again grow old and die out: to them, too, belongs that succession of phenomena which is wont to be termed life. Glottics, the science of language, is, accordingly, a natural science; its method is, on the whole and in general, the same as that of the other natural sciences.

It is obvious that what is given here is an entirely metaphysical description of language under the cover of a scientific and empirical theory. To speak of language as a thing that comes into being and withers, that has its youth, its prime of life, its senility, and its death is to speak in a mere metaphor. Such a metaphor is admissible if we understand it in the right way and use it with all the necessary critical reservations and limitations. Biologists and linguists are often engaged in the same battle against a common adversary, a battle that may be described by the slogan: structuralism versus mechanism; morphologism against materialism. In this combat they may allege similar arguments; they may make use of the same logical weapons. But that does not prove that there is any identity in their subject-matter, that, in an ontological sense, we can put human language on the same level as plants or animals. Language is neither a mechanism nor an organism, neither a dead nor a living thing. It is nothing at all, if by this term we understand a physical object. It is—language, a very specific human activity, not describable in terms of physics, chemistry, or biology. The best and most laconic expression of this fact was given by W. v. Humboldt, when he declared that language is not an ἑργον but an ἐνέργεια.

To put it shortly, we may say that language is "organic," but that it is not an "organism." It is organic in the sense that it does not consist of detached, isolated, segregated facts. It forms a coherent whole in which all parts are interdependent upon each other. In this sense we may even speak of a poem, of a work of art, of a philosophic system as "organic." Dante’s Divina Commedia, a tragedy of Aeschylus, Kant’s Critique of Pure Reason are "organic." What we find here are not "disjecta membra," scattered limbs of a poet, an artist, or a thinker. Everything hangs together: nothing is accidental or superfluous. In a tragedy of Shakespeare or in a lyric poem of Goethe we can hardly remove one word without destroying the character and the beauty of the whole. Lessing said of Shakespeare that it is just as impossible to steal a verse of Shakespeare as to steal the club of Hercules. Yet obviously that does not mean that a Shakespearean play, a symphony of
Beethoven, or a Platonic dialogue are natural things of metaphysical entities. When linguists or philosophers were speaking of the organism of language, they were, however, always liable to this fallacy. In Max Müller's *Lectures on the Science of Language* the development of human speech is described as if it were a physical necessity or a sort of metaphysical fatality. It is not in the power of man to influence this development.

"We might think as well," says Max Müller, "of changing the causes which control the circulation of our blood as of altering the laws of speech or inventing new words according to our own pleasure."

It is hardly necessary to criticize this strange theory. In his book *Language and the Science of Language* William Dwight Whitney has relentlessly brought into the open all the hidden ambiguities and errors contained in these words of Max Müller. Speech, he declared, depends entirely upon human activity; to eliminate this activity means the end of speech.

But let us now proceed to our second question. Is linguistics a natural science or is it a "Geisteswissenschaft"? Here, too, we have to begin by clarifying our terms. There is perhaps no other problem that, in these last decades, has attracted the attention of scientists and philosophers to such a high degree as the relation between "Natur-" and "Geisteswissenschaft." The question has been discussed eagerly, incessantly, and — unsuccessfully. The most divergent answers were given to it. Philosophers remained divided into two camps. The adherents of the natural sciences and the spokesmen for the "Geisteswissenschaften" could hardly understand each other. But, when studying this discussion, we meet with a strange phenomenon. So far as I see, the fact that there is such a thing as human speech and that there is such a thing as linguistics was never mentioned in this methodological struggle. Neither in W. Dilthey's *Einleitung in die Geisteswissenschaften* (Leipzig, 1883; last ed., Berlin, 1922) nor in H. Rickert's *Grenzen der naturwissenschaftlichen Begriffsbildung* (5th ed., Tübingen, 1929) do we find a chapter on human speech. To my mind this was a very regrettable lack, a sin of omission that could not fail to have its consequences. A theory of knowledge should be a sort of map of

11. New York, 1867; Second lecture, pp. 34 sqq.
our "globus intellectualis." But this map is, as yet, very incomplete. In our modern theory of knowledge linguistics is entirely neglected; it is treated as a stepchild. Yet how can we hope to get a clear picture of our "globus intellectualis" if such an important province is left out? Many excellent books have been written on the logic of science, of mathematics, physics, and biology. But a book on the logic of linguistics is still missing. If we had such a book, it could help us very much; it could lead to an escape from a dilemma that, in contemporary thought, has become, more and more, the "crux philosophorum."

Linguistics can, indeed, show us the right way and the wrong way. The wrong way consists in speaking of "Geisteswissenschaften" as if "Geist" were the name for a substantial thing. As soon as we accept this definition, we find ourselves immediately involved in all the well-known metaphysical antinomies. In one of his dialogues Plato describes Greek thought as a γιγαντιακόν, a continuous struggle between two parties which he terms the partisans of matter and the "friends of ideas". The former are not content until they have reduced everything to matter and movement; the latter try to convince us that spiritual reality is the only true reality. This description holds for the whole history of metaphysics. Since the times of Anaxagoras, all metaphysicians have seen in the νοῦς the great moving force of the universe. Nus, Spirit, Geist is the first actor in the great metaphysical drama. But, side by side, we always find its fierce adversary, its deuteragonist. The battle between the adherents of matter and the "friends of ideas" never comes to an end.

"The former," says Plato, "drag everything down from heaven and the invisible to earth. They lay their hands on all things and maintain stoutly that that alone exists which can be touched and handled. For they define existence and body or matter as identical, and if anyone says that anything else, which has no body, exists, they despise him utterly, and will not listen to any other theory than their own...Therefore those who contend against them defend themselves very cautiously with weapons derived from the invisible world above. maintaining forcibly that real existence consists of certain ideas which are conceived only by the mind and have no body. There is always a tremendous battle being fought about these questions between the two parties."12

12. Plato. Sophistes 246 A.
To quote Plato when dealing with the problems of modern linguistics sounds strange and arbitrary. I have, however, deliberately chosen this quotation; for it shows us, in a striking way, that there are some fundamental philosophical problems and some problems of scientific methodology which never lose their importance. They never grow obsolete; they reappear, in a modified form, at all ages and under the most various conditions. As a matter of fact, we could use Plato's description of the great γνώσημοψαχα as a very good formula for the struggle between the materialists and formalists in modern linguistics. The former "maintain stoutly that alone exists which can be touched and handled." And the only things in human speech that can be grasped in this way are sounds. Language consists of sounds. If we have found the mechanical laws that govern the phenomena of sound-shift, of phonetic change, we have found the laws of language. The adversaries of this thesis — the structuralists — defend themselves "with weapons derived from the invisible world above." They emphasize that sounds, as mere physical occurrences, have no interest for the linguist. The sounds must have a meaning; the phoneme itself is a "unit of meaning." And meaning is not a visible or tangible thing.

"Ce qui saute aux yeux avant tout," says the late N. Trubetzkoy in his article "La Phonologie actuelle,"15 "c'est la profonde différence entre la phonologie et la phonétique. Consciente de cette différence fondamentale, la phonologie actuelle ne cesse de l'accentuer avec toute l'énergie possible. La phonétique actuelle se propose d'étudier les facteurs matériels des sons de la parole humaine: soit les vibrations de l'air qui leur correspondent, soit les positions et les mouvements des organes qui les produisent. Par contre, ce que veut étudier la phonologie actuelle, ce ne sont pas les sons, mais les phonèmes, c'est à dire les éléments constitutifs du signifiant linguistique — éléments incorporels, puisque le signifiant lui-même est incorporel."

Here, I think, we have found a good answer to the question whether linguistics is a natural science or a "Geisteswissenschaft." It is indeed a "Geisteswissenschaft"; but in this case we must not understand the term "Geist" or spirit as designating a metaphysical entity opposed to another entity called "matter." If we accept the radical dualism between body and soul, matter and spirit, between "substantia extensa" and "substantia cogitans," language becomes,
indeed, a continuous miracle. In this case, every act of speech would be a sort of transsubstantiation. Speech is meaning — an incorporeal thing — expressed in sounds, which are material things. The term “Geist” is correct; but we must not use it as a name of a substance — a thing “quod in se est et per se concipitur.” We should use it in a functional sense as a comprehensive name for all those functions which constitute and build up the world of human culture.

It is one of the first and principal tasks of a philosophy of human culture to analyze these various functions, to show us their differences and their mutual relations, their opposition and their collaboration. If we do not content ourselves with such a critical analysis, if we begin to hypostatize them, if we look upon them as if they were separate, independent, absolute entities, we cannot avoid the strange conclusions drawn by Schleicher or Max Müller. Of all things in the world, speech is perhaps the best known and most familiar to us. It is our eternal companion; it is the atmosphere in which we live, move, and have our being. Nevertheless, we find many theories of human speech in which it appears as a very strange and mysterious thing. And we must not forget that, in this respect, the materialists and the spiritualists are in the same predicament. It is true that the former profess, in most cases, a resolute empiricism or positivism. They make a scorn of metaphysics and laugh at their romantic adversaries. But, when studying their works, we are often tempted to ask: “Quid rides? De te fabula narratur!”

To my mind, the answer to our question whether linguistics is a natural science is, in a sense, very simple. What is a natural science? It is a science that deals with physical objects. The physicist or chemist describes the properties of these objects, he studies their changes and tries to discover the causal laws of these changes. Linguistic phenomena may be studied in the same way. We may regard sounds as mere vibrations of the air; or we may, in the physiology of speech, describe the movements of our organs by which various kinds of sounds are produced. But with all this we have not yet crossed the borderline that separates human language from the physical world. Language is a “symbolic form.” It consists of symbols, and symbols are no part of our physical world. They belong to an entirely different universe of discourse.
Natural things and symbols cannot be brought to the same denominator. Linguistics is a part of semiotics, not of physics.

On the other hand, this dissimilarity of the objects of natural science and linguistics does not exclude a correspondence in the structure of the judgments that we find in both sciences. I have myself emphasized this correspondence. When studying Cuvier's *Leçons d'anatomie comparée* we find, over and over again, the same typical statements as in the works of modern linguists: "Si a existe, b existe aussi; si a existe, b manque; si a manque, b manque aussi." But, as I pointed out, this formal or logical analogy does not prove a material or ontological similarity in the subject-matter of linguistics and biology. The linguist lives in a world of his own. His is a symbolic universe, a universe of meaning. We cannot analyze meaning in the same way and according to the same methods that we use in a chemical laboratory for analyzing a chemical compound.

I wish to conclude these remarks by asking a historical question. Is it by mere chance that we find such a close agreement between widely different scientific problems? Can we connect these problems; can we show the way that could lead from Goethe's and Cuvier's morphological idealism to our modern linguistic structuralism? I think we can. The first attempt to create a philosophy of language, in our modern sense of this term, was made by Wilhelm von Humboldt in the introduction to his great work on the Kavi language (3 vols., Berlin, 1836-39). Humboldt felt not only the deepest personal friendship and admiration for Goethe; he owed to his work the best part of his intellectual and moral education. In his youth he had published, in Schiller's *Horen*, an interesting essay on problems of natural philosophy, in which he made use of Goethe's idea of polarity. But natural philosophy was not his real subject. His was a different scientific and philosophical interest.

"Im Grunde ist alles, was ich schreibe, Sprachstudium," he wrote in a letter to the famous philologist Friedr. Aug. Wolf. "Ich glaube die Kunst entdeckt zu haben, die Sprache als ein Vehikel zu gebrauchen, um das Höchste und Tiefste und die Mannigfaltigkeit der ganzen Welt zu durchfahren."

In this journey round the world, Goethe's ideas remained Humboldt's intellectual compass. He could not use them for his own subject. The problems treated in his work on the Kavi language
were entirely unknown to Goethe. But Humboldt transferred Goethe’s idea to a new field of investigation. Goethe had given his theory of organic types; he spoke of “Bildung und Umbildung organischer Naturen.” Humboldt spoke of linguistic types.

“All Geistformen sind ähnlich und keine gleichet der andern,
Und so deutet das Chor auf ein geheimes Gesetz,”
said Goethe in his poem “Die Metamorphose der Pflanzen.”

If in these verses we substitute for plants the different types of human speech, we have a clear and concise expression of Humboldt’s problem:

“All Sprachen sind ähnlich und keine gleichet der andern,
Und so deutet das Chor auf ein geheimes Gesetz.”

Goethe sought for this hidden law in the natural world; Humboldt tried to discover it in the cultural world, in the world of human speech.

But Humboldt was not only a friend and admirer of Goethe’s; he was also a student of Kant and a pupil of Kant’s philosophy. No other philosophical work had made such a deep impression upon his mind as Kant’s Critique of Pure Reason. In his essay “Ueber Schiller und den allgemeinen Gang seiner ‘Geistesentwicklung,’” Humboldt gave a general characterization of Kantian philosophy that, in spite of all the things that have been said and written about Kant, is in many respects still unsurpassed. But even in the work of Kant, Humboldt could not find an immediate inspiration for his own work. Kant was interested in mathematics, in physics, in ethics; but he was not interested in the problems of human speech. When Kant’s Critique of Pure Reason appeared, Herder complained bitterly that, in this work, the problem of human speech seemed to be entirely neglected. How is it possible, he asked, to criticize human reason without becoming a critic of human language? That was one of the principal objections raised by Herder. He became a fierce opponent of Kant; he wrote in 1799 his Metakritik der reinen Vernunft. Humboldt went the opposite way. He accepted Kant’s theory of knowledge, but he tried to complete it; he applied the principles of Kant’s critical philosophy to the study of human language.14

There was a time in which Humboldt’s ideas seemed to be entirely forgotten in linguistics. The positivistic schools of the nineteenth century looked upon his theories with a certain suspicion. At best, they saw in them mere metaphysical speculations without empirical purport and value. In this respect, too, modern structuralism has done very much to revise and correct our historical judgment.

"Je me trouve d'accord," says Viggo Brøndal in his article "Structure et variabilité des systèmes morphologiques," "avec l'universalisme exigé et pratiqué il y a cent ans par le grand maître de linguistique générale qu'était Guillaume de Humboldt."

And the program of structuralism developed by Brøndal is, indeed, very near to Humboldt’s ideas. "Our science," he declared in an address delivered before the Second International Congress of Phonetic Sciences, "should not be a mere storehouse of facts and figures. Our experience should not be confined to mere ear-and eye-and hand-experience." If this statement had been in need of a philosophical authority, Brøndal could have quoted Kant. Kant was neither an empiricist in the sense of Locke or Hume nor was he a rationalist in the sense of Leibniz. In his Critique of Pure Reason he drew the borderline between experience and thought, between a posteriori and a priori, in a new and different way. Leibniz, he declared, had intellectualized phenomena just as Locke had sensualized all concepts of the understanding. Both ways are inadequate. There is no opposition, no gulf between experience and reason. They are correlative the one to the other and must interpenetrate each other. In Kant’s critical or formal idealism we no longer find the same contrast between “vérités nécessaires” and “vérités contingentes,” “vérités de raison” and “vérités de fait” as in Leibniz’s metaphysical idealism. Nor do we find here the Humian conception that experience is a bundle of sense-perceptions. Experience, declared Kant, is a system; it is not a mere “Rhapsodie von Wahrnehmungen”. Without systematic

unity there can be no experience and no science; experience is possible only by the idea of a necessary connection: "Erfahrung ist nur durch die Vorstellung einer notwendigen Verknüpfung der Wahrnehmungen möglich."\footnote{17}

Since I am speaking before a circle of linguists, I may perhaps be allowed to end with the analysis of a word — of the German word \textit{Gestalt}. Of course, I cannot speak as an expert and I do not wish to encroach on your territory. What I can give you is only a rough and insufficient sketch; but, I think, such a sketch can help us to understand that general trend of thought which I have tried to describe in this paper.

According to Grimm’s \textit{Deutsches Wörterbuch} and Fr. Kluge’s \textit{Etymologisches Wörterbuch der deutschen Sprache}, \textit{Gestalt} is an old German word. Originally it occurred only in its adjectival form, and mostly in its negative form as \textit{ungestalt}. It is a participle derived from the verb \textit{stellen}. The substantive \textit{Gestalt} does not appear before the end of the thirteenth century. In most cases, it is used in a concrete sense; it designates the visible or tangible form of a material body, especially of a human body. A more abstract meaning comes to the fore in the great religious struggles of the German reformation. “Das Abendmahl in beiderlei Gestalt” is here in the focus of religious interest. Here we are very near to the symbolic meaning of the term. Grimm’s \textit{Wörterbuch} quotes Clemens Brentano’s verses:

\begin{quote}
“Brot und Wein, die zwei Gestalten,
Sind nur Zeichen, sie enthalten
Gottes volle Wesenheit.”
\end{quote}

Besides this religious development, we find another one that may be described as the philosophical history of the word “Gestalt.” Curiously enough, this philosophical history does not begin with the philosophers themselves. When Kant, in his \textit{Critique of Pure Reason}, approaches those problems that in our modern scientific terminology we should call “Gestalt probleme,” he does not use the German word. He goes back to the Greek term \textit{σχήμα} and writes his chapter on the schematism of the pure understanding.

The new philosophical and speculative sense of the term “Gestalt” appears first in German poetry. In his poem “Das Ideal und das Leben” Schiller uses the word for designating the ideal world, the Platonic κόσμος νοητός:

“Nur der Körper eignet jenen Mächten,  
Die das dunkle Schicksal flechten;  
Aber frei von jeder Zeitgewalt,  
Die Gespielin seliger Naturen,  
Wandelt oben in des Lichtes Fluren  
Göttlich unter Götttern die Gestalt.  
Wollt Ihr hoch auf ihren Flügeln schweben,  
Werft die Angst desirdischen von euch,  
Fliehet aus dem engen dumpfen Leben  
In des Ideales Reich!”

In Goethe’s morphology the term “Gestalt” has a different meaning. Even Goethe is a Platonist; he strives to find the typical features in natural phenomena. But according to Goethe, it is in nature itself, not beyond nature, that we have to seek for these typical features. The true “ideal method”—die “ideelle Denkweise”—consists in discovering the durable in the transient, the permanent in the changeable.\(^{18}\) The naturalist must be able to unite these two elements. Even in the most irregular phenomena he must make us see a rule that remains fixed and inviolable. In nature “Gestalt” and “Ungestalt” are bound together; the former appears only in the latter. Sometimes the norm appears in its clearest shape if we look at the so-called abnormal phenomena. Nothing in nature is arbitrary or lawless. Even the most accidental and haphazard changes obey a hidden law.

“Hier möchte nun der Ort sein zu bemerken,” says Goethe in his remarks on the great dispute between Cuvier and Geoffroy de Saint-Hilaire, “dass der Naturforscher auf diesem Wege am ersten und leichtesten den Wert, die Würde des Gesetzes, der Regel erkennen lernt. Sehen wir immer nur das Geregelte, so denken wir, es müsse so sein, von jeher sei es also bestimmt und deswegen stationär. Sehen wir aber die Abweichungen, Missbildungen, ungeheure Missgestalten, so erkennen wir: dass die Regel zwar fest und ewig, aber zugleich lebendig sei; dass die Wesen zwar nicht aus derselben

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Later on, at the end of the nineteenth century, we find a corresponding development in a new field, in that of psychology. When psychologists began to break away from the Humean tradition, when they became aware that psychic life is not a mere aggregate of sense-data or "simple ideas," they could find no better term for this new tendency than the term "Gestalt." The article of Christian v. Ehrenfels, who was the first to call the attention of psychologists to the new structural problems, bears the title "Ueber Gestaltqualitäten." Gestalt-psychology did not go back to former speculative methods. It did not develop a "psychologia rationalis" in the sense of Christian Wolff or other pre-Kantian thinkers. It remained an empirical science, using empirical methods. But in this field, too, we now meet with a new concept and a new description of empirical knowledge. When studying the phenomena of sense-perception, the Gestalt-psychologists had become aware of the fact that sense-perception has a definite structure. It is not a piecemeal of "simple ideas"; it is not, as Wertheimer said, a mere "Und-Verbindung." If we take all these various features together, the term "Gestalt" can do us an important service. It can help us to see the connection between problems that, at first sight, seem to be far remote the one from the other.

What I wished to make clear in this paper is the fact that structuralism is no isolated phenomenon; it is, rather, the expression of a general tendency of thought that, in these last decades, has become more and more prominent in almost all fields of scientific research.

Columbia University