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Is There a Linguistic Relativity Principle ?

On the Verification of the Sapir-Whorf-Hypothesis *

Benjamin L. Whorf's provocative thesis that human thinking depends on the "grammar" people speak is still highly controversial. In this paper I make a suggestion for a more rational solution of the problem. Whorf's crucial example, the conceptualization of space and time in the Hopi language, has been re-analyzed on the grounds of new material collected during field-work on the Hopi reservation. The results of Dr. Malotki's research into Hopi space are also mentioned. We would both like to correct some of Whorf's statements. Finally this paper presents the Hopi view of the world and outlines a general solution for the basic problem: the interrelationship between thinking, language, and culture.

When we hear the term 'relativity principle' we immediately think of Albert Einstein's famous theory of physics at the beginning of this century. We all know that this theory has something to do with the interrelationship of space, time, and mass (materia) in a cosmic frame, but only some specialists know and understand the details. Quite clear, however, is the following: relativity means that certain natural phenomena are relative to others or depend on others. There are interrelationships that exist between them.

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* Special University Lecture in Linguistics at the University College of the University of London (10th May 1977). Enlarged and improved version of a report given at a Colloquium on the Sapir-Whorf Hypothesis at the University of Ghent (Belgium) in winter 1971. Cf. R. Pinxten (ed.) 1976:217-228.

INDIANA 5 (1979): 1-14
ISBN 3-7861-3025-6
Ibero-Amerikanisches Institut, Stiftung Preußischer Kulturbesitz

Today we are not concerned with physics but with linguistics. When we speak of a linguistic relativity principle we have to explain what is meant here, and what are the phenomena which are said to be relative to each other. We are concerned here with the well-known problem of thinking and speaking or between thought and language. Many psychologists, logicians and linguists have held the opinion that human thinking follows general and universal laws of logic common to mankind and that language is only a secondary means to express human thought.

But this wide-spread opinion is not shared by all linguists. In 1940 the American linguist Benjamin Lee Whorf, a student of Edward Sapir, declared that human thinking depends on the grammar or structure of the natural languages people speak. People with different mother tongues think in different ways. This idea is not a new one: At the beginning of the 19th century Wilhelm von Humboldt expressed exactly the same thought in other words.

B.L. Whorf said: From this fact proceeds what I have called the 'linguistic relativity principle', which means, in informal terms, that users of markedly different grammars are pointed by their grammars toward different types of observations and different evaluations of externally similar acts of observation, and hence are not equivalent as observers but must arrive at somewhat different views of the world. (A more formal statement of this point appears in my article of last April.) From each such unformulated and naïve world view, an explicit scientific world view may arise by a higher specialization of the same basic grammatical patterns that fathered the naïve and implicit view. Thus the world view of modern science arises by higher specialization of the basic grammar of the Western Indo-European languages. Science of course was not CAUSED by this grammar; it was simply colored by it (1).

Humboldt said: Given the mutual dependance of (the) thought and (the) word it becomes quite clear that the languages are not mere means to represent the truth already perceived, but, far more than that, they are the means to discover first of all the truth which had been unknown before. The differences between them are not mere differences of sounds and signs but differences of the world views. This is the basic reason for all linguistic investigation.

The sum of everything that is recognizable by man and which has to be explored by him is to be found in and among all the languages and it lies independently of them in the very center. However, man can only approach this purely objective domain according to his faculty for cognition and sensation, in a subjective way (2).

This Humboldtian thesis was elaborated by the so-called Neo-Humboldtians, particularly by the German linguist Leo Weisgerber. In my own studies on the subject I have tried to place the 'linguistic world view' thesis on more solid foundations by reviewing concurrent concepts. Without repeating every stage of the argument, it seems advisable to make the following distinctions, in order to avoid misunderstandings and provocation of fruitless discussions. To ex-

plore the fundamentals of the linguistic relativity principle, we must distinguish among three concepts, which are clearly delineated in the German philosophical tradition: 1. Weltbild, 2. Weltanschauung, and 3. sprachliche Weltansicht (Humboldt) or sprachliches Weltbild (Weisgerber) (3).

1. By Weltbild is meant the scientific view of the interconnections of the world or cosmos, i.e. a cosmography. Thus we speak of a Ptolemean Weltbild, of a Galilean or a Einsteinian Weltbild. In this sense Weltbild is the product of scientific thought of an era.

2. Weltanschauung refers to the structure of human belief concerning the nature of the world and human affairs. It is an ideological concept with religious or political implications. We speak thus of a Christian, a Marxist, an idealistic, or a materialistic Weltanschauung.

3. With the term sprachliche Weltansicht or sprachliches Weltbild we imply that our experience of the world is construed not only by our senses but also by the categories of the language we have learned. The vocabulary we use construes a specific view of things, of facts, and of events. Sprachliches Weltbild is an a priori condition making specific thought and speech possible.

Following the definition of "Sinn" by the logician G. Frege we may say that sprachliches Weltbild has to do with the 'Art des Gegebenseins von Welt in den Kategorien und semantischen Gliederungen einer natürlichen Sprache' (the nature of the representation of the world in the categories and semantic structures of a natural language) (4). The concept is devoid of ideological speculation; it points to the condition of human existence.

Now let us try to explain what is meant. First of all let us look for a simple example to demonstrate the difference between language structure and their positive influence on thought. A well-known and often discussed example for the semantic difference of language is that of color terms. There is no doubt that there are different systems of color terms in the languages of the world. We know languages with three or four color terms and others with hundreds of color terms with respective range. What is the reason for this difference? Is there a different perceptual ability in the organs of sight in different human races, or are there different stages in the evolution of these faculties?

Gladstone, the former Prime Minister of Great Britain, indeed held this opinion. In his studies on Homer and the Homeric Age (1858) he stated that the Greeks at that time had been partially color-blind. One of the proofs for him was the fact that Homer described the rainbow by only one color term, namely πορφύρεος. Gladstone said: The Greeks were only able to notice a difference between light and dark. Real color terms developed slowly, beginning with red shades like ἐρυθρός and ξανθός (5).

The differentiation goes hand in hand with the evolution of the human sight-organs. This provocative thesis was discussed by scientists of different dis-

ciplines. There were physiologists such as H. Magnus and L. Geiger who supported Gladstone. Others, such as G. Allen, W. Hochegger, and A. Marty denied such a possibility. Today we can definitely say that Gladstone was completely mistaken.

There has been no biological evolution in the short period of time from antiquity to our age. What really has happened is a differenciation in the system of Greek color terms. I investigated the problem and I especially studied the use of the central term purple (πορφύρεος) which represents a corner stone of Gladstone's theory. Purple in ancient Greek covered all the colors of the rainbow. I cannot repeat the details here but the following facts may be of interest. In classic Greek πορφύρεος is a polyseme, its value depends on various specific semantic factors. The color word purple which still exists in many Indo-European languages does not in fact denote always the same color. Today there are still remarkable differences between English, French, and German, to mention only these three languages (6).

In English purple is a word for a dark bluish color similar to what we call violett in German. English violet seems to be a paler shade. In French pourpre means a brighter red, in German purpur denotes a shining dark-red color which is definitely not as dark as violett. (Think of purple plums and the German song: 'Ein Männlein steht im Walde ganz still und stumm. Es hat von lauter Purpur ein Mäntlein um'. The fruit meant is English rose hip). These differences are partly due to historical reasons (different raw materials for the production of the color pigments), but the main reason is to be found in the different structure of the lexical field of color terms in the respective languages.

I am glad to be able to prove this by a convincing color sample which I have brought with me. When the preparations for the coronation of Queen Elizabeth were in progress, the court ordered from Germany a special purple velvet for the official robes. This purple velvet had to be produced according to old formulas of the dyer's art in order to guarantee the true color. The German firm delivered the original color in a shade which must have been somewhat disappointing for the British commissioners. That tint was not the English purple but a color which was much lighter than that. The British nevertheless accepted the velvet but they named it coronation red. This circumstance points out to the linguist that he is dealing with an unusual English color value. Here is the sample and the proof (7).

Purple has indeed different values in different languages because they do not have the same systems of color terms. The special value we have to account for depends on the number and the individual range of the terms in question. He who is accustomed to the values of his mother tongue perceives the differences guided unconsciously by the semantic field in his native language.

Now let us turn back to Whorf and especially to the Hopi-Indians. Whorf tried to prove his thesis by the results of his studies in the Hopi language.

The Hopis are a small tribe of Pueblo Indians in Arizona, USA. There are still about 6000 Hopis living in the reservation. Their villages are built on three so-called mesas, that is rocky elevations in the desert of Arizona. Their language belongs to the family of the Uto-Aztecan languages. It is not well-known in linguistics. We have no comprehensive grammar and no dictionary of the language and it is not written (8).

Whorf studied Hopi with the help of an informant who lived near New York. The results of his investigations were surprising. The Hopi language seemed to be quite different from English and the other Indo-European languages. Whorf was of the opinion that the thinking of the Hopis must consequently be quite different from ours. The main difference had been found in the Hopi concepts of space and time. That is the corner stone of his relativity principle.

Whorf stated that the Hopi language contains no reference to 'time', either explicit or implicit.

There are no tenses in the Hopi verb but a considerable number of aspects and modes to express different kinds of actions, and especially duration.

There are no substantives denoting time intervals such as English time, day, hour, etc.

Expressions for time intervals occur; Whorf calls them temporals belonging to the category of adverbs.

These temporals can never be used as subjects of sentences.

Time intervals cannot be counted as real objects are counted in our languages, that is by cardinal numbers plus the plural form of the counted substantive. They have no plural form. The only possibility is to employ ordinal numbers plus singular of the substantive, which - as Whorf believes - is not real counting.

There are no time-space metaphors such as long and short period of time, before or after two days, length of time, etc.

With regard to space the differences between Hopi and English seemed to be much less noticable. Now let us see, if Whorf is right or wrong.

Some necessary CORRECTIONS to the views of B.L. Whorf:

An exhaustive analysis of Whorf's own controversial papers on the conception of time and space in Hopi - including his grammatical sketch of the Hopi language, Toreva dialect - reveals that such provoking statements of his, as 'The Hopi language contains no reference to time, either explicit or implicit', are misleading, and even false. The Hopi language does indeed contain a considerable number of expressions referring to space and time. This statement can partly be supported by Whorf's own material. Since Whorf fails to offer a synopsis of the relevant expressions in Hopi, it is impossible to verify his interpretations of the specific Hopi world view. After a careful study of the linguistic data during the last few years I am able to support some of Whorf's theses but I must at the same time refute some of his particular statements. I propose the following corrections to the conception of time and space in the

Hopi language, using, in addition to my own observations, material from several newer publications.

1. A linguistic analysis of the Hopi expressions in question shows that they can be interpreted by Indo-European grammatical categories. There are nouns, adjectives, verbs, and adverbs or particles similar to adverbs (locators and temporals). The Hopi language even shows a striking tendency to verbalize the nonverbal categories. Verbalization is effected by adding special suffixes to nouns, adjectives, etc.

2. There is evidence for time intervals which can be said to belong, contrary to Whorf's view, to the category of nouns, and at least some of these nouns can be pluralized. Pluralization is often made by reduplication of the first morpheme of the word in question.

3. These nouns for time intervals can also occur in a grammatical or syntactic function which corresponds to that of a subject (in the nominative) in Indo-European sentences. This Whorf denied.

4. Contrary to Whorf's opinion, expressions for spatial relations are used metaphorically in a temporal sense, in other words, there are space-time metaphors as in Indo-European languages.

5. Whorf's statement that in Hopi time intervals cannot be counted in the same manner as are material objects but are used in the singular combined with the ordinal number, is questionable.

The problem seems to be a question of interpretation. In order to find a satisfactory answer to this question we have to consider first the numeral system in Hopi. There are simple numerals up to ten on First and Second Mesa, and up to twenty on Third Mesa. Higher numbers can be formed by combination (multiplicatives) with tens and twenties, at least theoretically, but this method seems to have been largely replaced nowadays by the English counting system. So on Third Mesa the number seventy-five may be expressed by saying paíp sunát pákt cívot síkaita - 'three times twenty-ten-five-(plus)', but certainly it is not usual to do so.

Besides these cardinal numbers there is another set of numerals with the element - sikis - which means literally '-times', as in English four times. Thus we have expressions corresponding to English once, twice, three times, etc. This meaning is confirmed by sentences as 'The chief smoked four times', etc.

The most important intervals in Hopi life are years, months, and days. (I have not found expressions for minor intervals corresponding to English hour, minute, second.) Time intervals, above all days, are counted, especially in connection with the ceremonies. The most important intervals are four, six and twenty days. To count these intervals the second system of numerals is often used, e.g. the numeral with the -sikis element plus the (noun) interval in the singular.

In relevant publications we often find in this connection the English translation 'first, second, third (day)', etc., that is the English ordinal number with the noun in the singular. Is this translation justified? And is it correct to conclude, as Whorf does, that the intervals, striktly speaking, are not counted at all?

Yes and no. In fact, the meaning of the two translations 'fourtimes-day' and 'the fourth day' may be nearly identical in many cases. Nevertheless it is hypothetical to interpret, as Whorf does, that time intervals are not counted. Some of my informants gave me combinations of a cardinal numeral plus noun in the singular, e.g. cívot tala 'five day(s)'. And we also find examples, where the -sikis form is combined with the plural, e.g. paish'tala toto 'kya - 'third day sleeps'.

It is worth mentioning in this connection that in German and in English we have also cases in which weights and measures are counted with cardinal numbers plus singular. So we have fünf Pfund - 'five pound', fünf Fuss - 'five foot' (fünf Füsse meaning five different members of the body). Nobody would say that these weights and measures are not regularly counted.

I think we can assert that time intervals are counted even if the singular be used.

Another possible way of counting time intervals, which seems to be the most usual one, is to use the cardinal number combined with the element -tok which originally meant 'night' (toki), the final vowel being lost. So we have lötok- 'two night', páytok - 'three night', etc. It is possible that an original reduplication of the morpheme meaning 'night' has been lost in these patterns. The element -tok seems to have been reduced to a mere grammatical component.

We know that the counting of nights is important in Hopi ceremonies. Nevertheless none of my informants was aware of the fact that there is the element 'night' in these constructions. The old meaning of the element has been completely lost.

Last but not least there is - as my informant Mr. Kootshongsi assured me - even the possibility of using the cardinal number for one plus singular, two plus dual, and three plus plural, etc., e.g. súka múyaw(u) - 'one month', löyöm múyawt - 'two months', páyom múmúyawt - 'three months' (with reduplication!).

6. There are time expressions for the different phases of a day from dawn to dusk and there are also expressions corresponding to today, yesterday, tomorrow, etc.

7. There are grammatical means in Hopi to express present, past and future, though the Hopi thinking seems to be governed by a bipartition of time ('present' + 'past' - 'future') instead of the tripartition of time ('past'-'present' - 'future') we are accustomed to. In the verb there are forms for actual events which can also be used for past events, often combined with special particles denoting past. Thus we often find in stories and tales the particle yaw (Whorf's 'quotative modality') which is generally translated by 'it is said'. This translation is completely misleading since yaw is not a form of a verb 'to say' but a particle having the approximate meaning of 'then', 'after that'. If this particle is used we know that the reported event is in the past. Even when direct speach is used in a story in which a person is speaking of something to happen in the future the particle yaw is used. It reminds the hearer or the reader that he is still listening to a story related in the past. (Other particles, which are able 'to make events more past', as some of my informants put it, are pai, ep.)

'Future' in the broadest sense - including everything which has not yet happened, which is desired, wished, wanted, planned, etc. - is expressed by the suffix -ni which can be combined with different word classes. There are still other particles to place an event in the present, past, or future.

This corresponds at least partly with Whorf's dispersed data, although he denies a temporal interpretation of these linguistic forms.

8. The Hopi verb is a most interesting and complex phenomenon containing many temporal elements. There are several 'aspects' (I would prefer the German term Aktionsarten in order to avoid confusion with the well-known aspects of the Slavonic languages) to express durative, progressional, continuative, ingressive, and iterative events. All of them refer directly or indirectly to time, a fact Whorf failed to acknowledge.

9. There are also interesting possibilities of expressing, by the means of certain suffixes, the time relation between two and more events in complex sentences with different clauses. Since Mrs. Stahlschmidt, a student of mine, is preparing a dissertation containing a complete analysis of these complex details, I omit the problem here.

10. There seems to exist - or at least to have existed - a special word for 'time', which, however, Whorf - and my informants - denied. The word shato - 'time', which occurs in the expression nono'bshato - 'food time'. Whorf himself mentions sa'to, n. My student suggests that this element is contained in hi(n)sato, that is, in combination with the indefinite or interrogative pronoun. The word hisato is common in Hopi.

We may thus conclude that although Whorf's exaggerated statements require some correction, there remains evidence for the fact that Hopi-time is, in various aspects, different from ours.

These are the results of the investigations I had arrived at in my book "Gibt es ein sprachliches Relativitätsprinzip" (1972) (9). In the meantime a student of mine - Dr. Ekkehart Malotki, Flagstaff (Arizona) - who studied the problem for three years in the field and who has learned the Hopi language in a profound way, is preparing an exhaustive analysis of time expressions in the Hopi language which will be completed in about two years. There may be further corrections to Whorf and to my statements.

As to the conception of space the difference between Hopi views and ours seemed to be, following Whorf, less evident. Dr. Malotki presented a German doctor's dissertation with the title: Hopi Space. A semantic-grammatical analysis of spatial concepts in the Hopi language (in print). This dissertation which won a prize from the Westfälische Wilhelms-Universität Münster contains an exact analysis of the whole problem and gives definite answers to all relevant questions.

Dr. Malotki gives the following report of his work and his results:

"The objectives of 'Hopi Space' are not primarily a discussion of the Language Relativity Hypothesis (LRH) but a documentation and classification of some of the linguistic reflexes making up the spatial domain of the Hopi lexicon.

The spatial configuration that evolves from the linguistic data would argue against any strong version of not a denial of the LRH and thus confirm that cognition is essentially the same for all speakers.

Hopi Space, as mirrored in the Hopi language, is just as threedimensional as in our Standard Average European (SAE) languages. The fundamental concepts of 'being in/on/at a place' (locative), 'going to / towards /into a place' (destinative) and 'coming from/out of a place' (ablative) are its main pillars and this conceptualization is to be expected of natural languages.

Whorf himself has, of course, never made as much of a striking difference between Hopi and SAE space as of time. "The apprehension of space is given in substantially the same form by experience irrespective of language". On the other hand Whorf never fully came to terms with the sophisticated formal apparatus that Hopi offers in its surface cast. And it is indeed on this level that Hopi displays a possibly finer differentiation in its categorization of experience than any of our well-known SAE languages.

Hopi subcategorizes two of the three fundamental spatial concepts that are treated here as cases as was first suggested by Whorf. My respective labels are locative, destinative, and ablative.

The locative is subjected to two subsystems that govern the overt suffixal behavior of morphemes denoting a spatial configuration. The first subcategory analyzes the area of contact between a given 'space occupant' and its location along such lines as 'punctual' and 'diffuse'. It is labeled 'field concept' (FC).

The second subcategory subsumes such criteria as distance and position. Depending on the relative distance that a given 'occupant' is separated from the speaker or another reference point, both on a horizontal as well as vertical plane, differing case-markers will be used to signal the proximal or distal relations. As to the second criterion, this category pays attention to certain physical features of the location involved. If it constitutes an end point, peak, rim, or edge, it is marked in the same way as a location that is distant, be it on a horizontal level or far up down on a vertical one. Since both criteria involve spatial 'extremes' this categorization is termed 'concept of extreme distance and position' (EXC).

The destinative, a label for the directional notion of 'to-ness' is also subjected to the EXC. It thus requires the speaker to commit himself whether the destination envisaged is close or far (both on a vertical and a horizontal plane), whether it constitutes an edge or rim, or whether the occupant is 'swallowed' by the destination, a more or less 'logical' application of the EXC which in conjunction with directives expresses the idea of 'into (a mass or hollow destination)'.

The ablative, finally, is neither concerned about a possible FC nor EXC. Whether an activity originates from a point or an area in space, whether it stems from a point that is close or far to the speaker, or emanates from a hole or mass configuration, formally this has no bearing on the ablative marker.

The formal apparatus thus provides a tripartite case system that is stocked with seven different case markers (four for the locative, two for the destinative, and one for the ablative). It is this tripartite case system (in its abstract form) with its concrete case endings (both in a regular system and many additional irregular forms) that is all-pervasive in Hopi expressions dealing with spatial reality. The case markers attach to the following elements:

1. pronominal bases (personal/demonstrative/reflexive-reciprocal/interrogative-indefinite);
2. non-free space morphemes encoding such concepts as up, down, between, cardinal directions, mesa edge, etc.;
3. lexemes that verbalize individual spatial realizations such as houses, mountains, rivers, also place names and body parts;
4. numeral bases (only cardinal numbers).
5. Metaphorically they fuse, as might be expected, with temporal expressions referring to such concepts as noon, evening, summer, tomorrow, some time, etc.

For nouns or nominals (including nominalized clause constructions) which a number of constraints is preventing from attaching the case suffixes Hopi provides a number of free postpositions. The inventory of these postpositions, matching the spatial categories of the case markers is built on the third person pronoun base ?a- that acts as a pronoun-copy of the preceding nominal. Many of the spatial items listed under 2. may also enter such pronoun-copy constructions.

Within the three-dimensional frame-work delineated here many more detailed observations are possible. They range from idiosyncratic applications of spatial terms such as the use of the cardinal direction terms within the living quarters of a house to the verbalizations of cosmic or mythological concepts. Although they vary in many respects from what we are accustomed to in our SAE languages they are none the less basically indebted to a spatial view of this world that we also share."

We have seen that the Hopi system of space expression is complicated but, nevertheless, the Hopi Indian employs it with the greatest ease. When Dr. Malotki will have completed his studies we can hope that all questions we still worry about will definitely be answered.

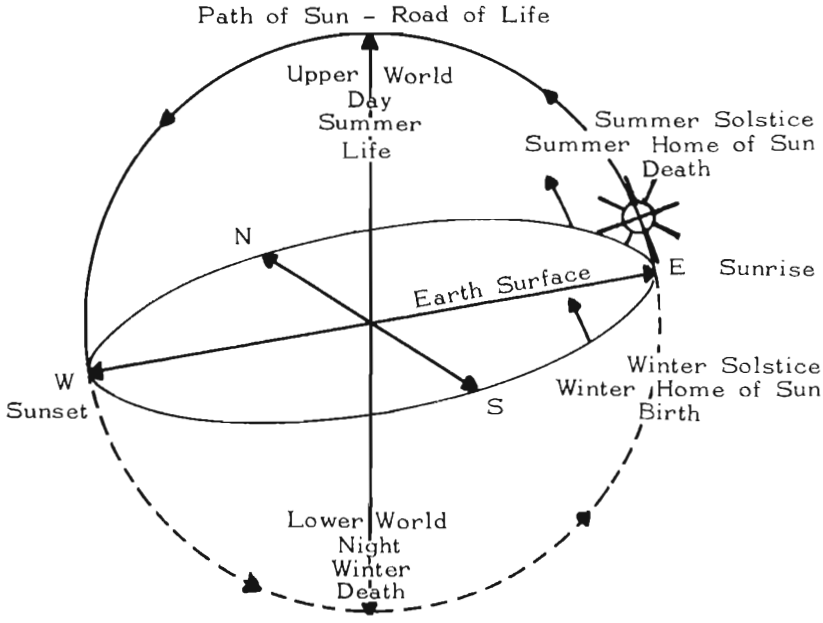
Following on all these corrections, what remains of Whorf's statements? Can we assert that the Hopi conception of time differs radically from that of Standard Average European?

Our analysis seems to imply a negative answer, but in reality the problem is much more complicated. First, we must not forget that fundamental conceptions of human life such as space and time are not exclusively bound to language but are dependent - as language itself - on the whole 'context of culture' of the given society. Language cannot express all the details; language is always abstractive and the meaning of words has to be supported by the thing meant. We must take into account the whole of Hopi life, the beliefs of the people as well as their remarkable geographical location.

Let us, therefore, consider the Hopi cycle of the ceremonial year, the Hopi road of life, the world view of the people reflected in the events during the year and during the life of the individual. Here we find evidence for the pre-

dominance of a cyclic conception of time combined with a dual conception of human life on earth and the 'life of the dead' in the underworld.

In Hopi thinking this cyclic principle is characteristic. We must compare the cycle of Hopi life to a wheel which turns eternally on one spot without progressing. As the Hopi have no calendar, years are not counted continuously. What people experience seems to be the steady repetition of the same sequence of events, of seasons, of seedtime, harvest, winter, spring, and so on. They live in time, but not apart from it, they are bound up in time but are not neutral observers of objective physical time. They do not live by the clock as we do. The course of the sun is the measure of Hopi time.



The Hopi World View (10)

The point of sunrise is observed precisely and constantly. The so-called 'Crier Chief' announces what has to be done when the sun has reached certain points. The names of the months reveal that the cycle on the surface of the earth finds its repetition in the underworld.

The Hopi are still completely integrated in their environment. They have not yet reached that detachment from events which is one of the outstanding prerequisites for our Western concept of physical time. Their conception of time corresponds to that of old peasant societies.

I should like to add here a personal experience. When I first entered the house of Chief Joe (more precisely of his sister Elsie) in Shipaulovi (Second Mesa), I was much surprised to see an old alarmclock. But I soon discovered that this alarmclock was not going and that it was not needed. I was told that this clock had been used to have the school children ready for the schoolbus which took them to the American Day School. Watches and clocks are even today no real ingredients of Hopi life. There is, as E.T. Hall put it, a 'silent language' of time (11). This fact became evident to me on the occasion of the famous snakedances. Nobody could tell me at what time these dances would take place. Time must be 'ripe', they would say. Before these dances begin, people wait for hours until all preparations in the kivas that is the underground ceremonial houses are completed. Time is important on these occasions, but it is not our time; it is rather the duration of certain ritual events relevant to Hopi life.

Nevertheless, we are able to understand what happens. There are, as already mentioned above, traits in the Hopi thinking and behavior which are typical for all old peasant cultures, and so we can find even today in Europe similar phenomena. All people, who live a simple peasant life, who depend on the sun and the rain as the Hopis do, are supposed to have a more cyclic time experience rather than a linear concept of time, which is characteristic for members of modern Western civilizations.

An additional remark may be useful. In a 'primitive' or original culture like that of the Hopis a scientific Weltbild has not yet been developed. The Hopi cosmography is - if there is any - closely linked with the Hopi Weltanschauung, that is their religious beliefs. Hopi thinking has not yet reached a critical distance towards language. The confidence in the 'truth values', so to speak, of the mother tongue is therefore greater than in our societies. Thus the Hopi language can be said to be an authentic key to the understanding of the Hopi Weltanschauung. In other words, the sprachliche Weltansicht of the Hopi language is a more adequate expression of Hopi thought than this is nowadays the case with the Indo-European languages. Therefore a careful study of the Hopi language and that of the other Indian languages is important for the problem of the linguistic relativity principle.

For further details I refer to my book "Gibt es ein sprachliches Relativitätsprinzip?", which contains more Hopi material including special word lists for the expressions of time and space (Gipper 1972).

The interpretation I had to offer takes account of the whole cultural context of Hopi life including language. Language is understood as an obligatory medium of thought which has been formed by the speaking community during the centuries and which as a soziales Objektgebilde in the sense of the German sociologist Alfred Vierkandt shapes and influences the behavior of the speaker. Since this interrelationship is dialectical in nature, linguistic research cannot be undertaken in isolation from the speakers and the world they refer to.

Human thought is, to be sure, relative to the possibilities of the languages in which it is expressed, but it is not determined by language. Each natural language represents an open system and therefore it is open to be changed by the speakers.

There are universal traits in each natural language because they all depend on general conditions of human existence and human life. But the universals are either fundamental, e.g. they refer to existentials of human life or are situated on a high level of abstraction attainable only by scientific reflection. In, however, the wide middle zone in which human life and behavior takes place, we find differences which characterize cultures and civilizations. It is highly important and relevant to discover these differences. Therefore we have to investigate the linguistic world views of the given languages in order to find a key to better understanding among the people of this world.

NOTES

(1) Cf. B.L. Whorf 1956: 210.
(2) Cf. W. v. Humboldt 1905, vol. IV: 27 (translation H. Gipper); also in Humboldt 1972, vol. III: 19-20.
(3) Cf. H. Gipper 1977.
(4) Cf. G. Frege 1892.
(5) Cf. W.E. Gladstone 1878.
(6) Cf. H. Gipper 1964.
(7) I presented to the audience a velvet sample of the original "coronation red" produced by the German Samtweberei Peltzer, Krefeld, which is no more available. An original sample is to be found in H. Gipper 1964.
(8) Only at the end of the nineteenth century American scholars began to write Hopi words and texts.
(9) Cf. H. Gipper 1972.
(10) The figure is a combination of M. Titiev's figures 7, 8, and 9 (Titiev 1944: 173, 174, 176) and of figure 58 in F. Waters (1963: 189).
(11) Cf. E.T. Hall 1967.

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