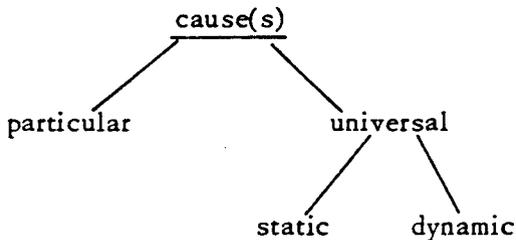


EPISTEMOLOGICAL REMARKS ON LANGUAGE CHANGE AND LANGUAGE UNIVERSALS

by HELMÜT LÜDTKE

1. Concepts

Research aiming at an explanation of language change may be classified in the following stemma:



according to the epistemological prerequisites adduced (whether explicitly or not) by the single linguists. All those who claim that every change that occurs in a given language is entirely due to some particular language-external event in society must abandon the search for a universal theory of language change. On the other hand, admitting the possibility of, even engaging in the search for, universal inherent laws that make every language change in no way implies a denial of the influence of external factors. On the contrary, a dynamic approach as envisioned by E. Coseriu¹ and by the present author² makes compatible two assumptions, viz. that lan-

¹E. Coseriu, 'Sincronia, diacronia e historia', *El problema del cambio lingüístico* (Montevideo, 1958), ch. 2.3, 3 (= pp. 43-46), and *passim*.

²H. Lüdtke, 'Sprache als kybernetisches Phänomen', *Bibliotheca phonetica*, 9 (1970), 34-50; 'Zur Theoriebildung in der Phonetik', *Folia linguistica. Acta Societatis Linguisticae Europaeae*, V-3/4 (1972) 331-354).

guage change is governed by universal laws, and that it is also due to the rôle of language in society.

Avoiding any idealistic premises we introduce some concepts novel to or – to say the least – not yet very current in the epistemology of linguistics, viz. *circularity* (replacing unidirectional causality, as in cybernetics),³ (*ir*)*reversibility* (taken from thermodynamics)⁴ and *homeorhesis* (or *steady state*, or *homeostasis*; from general system theory).⁵

The *circularity principle* concerns the relation between linguistic communication processes (performance) and the communication potential (competence) continually building up in the human brain. In other words: while redundancy in linguistic messages makes it possible for communicative devices to be learned through or gathered from experience, once such devices have been acquired they will in turn be made use of to improve the language-user's strategy of communication.

The property of being either reversible or irreversible relates to mutational processes ('change in time') undergone by linguistic items (i.e. units or parts of systems).

Homeorhesis is an ability characteristic of complex open systems to keep functioning in spite of irreversible processes taking place within them. Living beings constitute one, languages another, type of homeorhetic systems.⁶

2. Processes

Thinking in the paradigm sketched above leads to further postulates that may be stated in the following way (the formula 'X ← Y' being read as 'X is secondary to Y'):

linguistic reflection ← linguistic communication
linguistic change ← communicative activity
linguistic structure ← linguistic development

³ H.-J. Flechtner, *Grundbegriffe der Kybernetik* (Stuttgart, 1966), pp. 32 ff.; A. Ya. Lerner, *Fundamentals of Cybernetics* (London, 1972), pp. 48 ff.

⁴ Fr. Bonsack, *Information, thermodynamique, vie et pensée* (Paris, 1961), pp. 23-26, 73-76, and *passim*.

⁵ L. von Bertalanffy, *General System Theory* (New York, 1968), pp. 141-145 and *passim*; A. Wilden, 'System and Structure', *Essays in Communication and Exchange* (London, 1972), pp. 354, 363 ff., and *passim*.

⁶ L. von Bertalanffy, *op. cit.*, p. 142; H. Lüdtkke, 'Sprache als kybernetisches Phänomen' (see fn. 2).

universal laws of
 language structure ← universal laws of language change
 segmental units ← segmentation processes

The most crucial question that arises in such a dynamic framework is whether language change is goal-directed. The answer cannot be simply 'yes' or 'no', but has to be differentiated according as it refers (i) to the whole set of mutational processes that a given language undergoes within a given period of time, or (ii) to single processes in particular. The latter may be due either to some universal constraint or to optimizing (and in the latter case are, in a sense, goal-directed), while the total effect at the system level will be a homeostasis or a steady state, i.e. the preservation of fulfilled communicative requirements through functional (or quantitative) near-stability, combined with a tolerance for drift toward outward (or qualitative) otherness (differentiation).

Another question might be asked as to whether language change is *necessary* or *contingent*. The issue would seem to be between the discovery of some universal constraint leading inexorably toward change and the hypothetical possibility that change is due only to the conscious activity of language-users. Now it can be shown, on the one hand, that the long-term mutations taking place beyond the single speaker's consciousness tend, in the long run, to impair the fulfilment of communicative requirements, so that, on the other hand, conscious short-term activity by speakers, directed toward optimizing, is needed to counterbalance the negative effects of long-term random processes. Therefore, if we say – as we might – that language change takes place *necessarily*, we must bear in mind that it does so in two distinct meanings of 'necessity': as a universal constraint that lies beyond man's linguistic consciousness, and as a required reaction that stems from it.

These two types of processes differ in many ways: as to whether their chronological frame is shorter or longer than a person's life span, with respect to goal-directedness vs. randomness, and with respect to consciousness vs. unconsciousness. To these properties may be added the particular bearing which mutational processes have on the amount of heterogeneity in language: convergent (centripetal) vs. divergent (centrifugal) development;⁷ and also the greater or lesser accessibility of phenomena to linguists.

⁷ H. Paul, *Prinzipien der Sprachgeschichte* (51920. Reprint Tübingen 1966), §§ 22-24.

These general qualities that we attribute to mutational processes in language are listed synoptically in the following table:

| MUTATIONAL PROCESSES | | |
|--|----------------|---|
| TYPE 1 | CLASSIFICATION | TYPE 2 |
| short-term conscious goal-directed reversible | properties | long-term mostly unconscious random irreversible |
| convergent (aiming at diminution of heterogeneity) | effect | divergent (leading toward increase of heterogeneity) |
| easily observable | accessibility | requiring extant written sources ⁸ and sophisticat- ed methods of investiga- tion |

As regards the opposite effects of both types of mutational processes upon the total amount of linguistic heterogeneity, we assume that type 2 processes are a *natural corollary* of human communicative activity⁹ while type 1 is due to *reflection* (i.e. the individuals' consciousness of their communicative experience, with ensuring metacommunication or commenting upon it). It follows that both types of processes, stemming from independent sources but having a conjoined effect upon heterogeneity (i.e. limitation of the range of communication), together result in keeping the amount of heterogeneity *oscillating*. That means that any trend toward greater or toward lesser linguistic heterogeneity (among mankind or among single populations) will, in principle, be reversible.

On the other hand, since reflection is secondary to communication, type 1 processes may – with the above proviso – be viewed as a necessary compensation for the self-destructive randomness inherent in communication.

⁸ This holds good for the present moment. In a distant future, when there are oral records of long-past speech, the situation will be different.

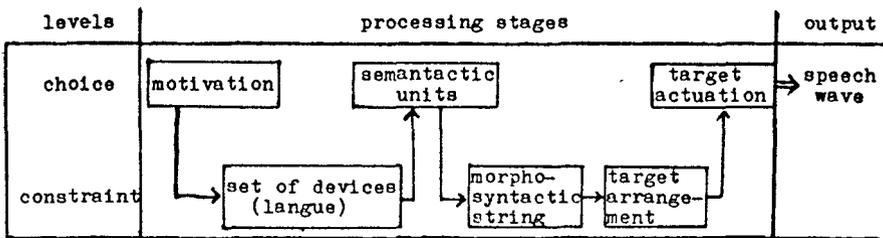
⁹ See fn. 1 and 2.

3. Mechanism of change (type-two processes)

The speaker's communicative activity is a complex interplay of *choice* and *constraint*. Although thought is – in a general sense – free, to communicate thought efficiently entails sending it through prefabricated linguistic channels. Channels, however, are manifold, and the speaker himself selects the proper ones.

The speech act should be viewed as a succession of stages (i.e. several intra-cerebral, efferent, and motor processes), some of which are regulated entirely by conventional constraints (the 'language system'), while others involve choice, i.e. acts of selection, either among numbers of discrete possibilities or among values on continuous scales.

Both the succession of stages and the interplay of choice and constraint in the speech act can be schematised as follows:



A verbal presentation of the above schematism would run like this: a person's specific motivation for a speech act is processed through the language system, the first part of which is a finite set of expressive devices. Neglecting a few coefficients such as sentence intonation, we may continue by saying that the speaker performs a selection among the given devices, and that this results in establishing semantactic units; these, in turn, are assigned some sequential order, i.e. are made into a string which is encoded into an array of articulatory targets (phonetologic representation); this is further processed through the target-actuator, which, on a continuous scale, regulates the overall physical effort of the speech-production apparatus. The resulting output is more or less slurred (i.e. normal) speech.

Change operates through choice; consequently, three kinds of change are to be distinguished: one that works through motivation; one, through the establishing of semantactic units; and one, through target-actuation. Motivation may get to be different as a result of the inconstancy of social parameters and of the outside world; this kind of change primarily affects the frequency of particular selec-

tions, but may in the long run have repercussions on the whole language system. The other two, i.e. change through target-actuation or *phonetological* change and through the establishing of semantactic units (hence: *semantactic* change), may be called language-internal or *intrinsic*, in contradistinction to extrinsic motivational change – whose occurrence is, of course, trivial for the present argumentation.

The mechanism of intrinsic change can be understood roughly from numerous empirical instances, which indeed show that phonetological change, as observed over a sufficient stretch of time (not much less than a millennium), is *reductive* – semantactical change, contrariwise, being *augmentative*. The problem arises as to how these findings can be made to fit into an explanatory framework where they are deducible from theoretical assumptions.

First of all, it must be made clear that the notion of reduction refers to semantactic units, in the sense that the phonetological representation assigned to them gets abbreviated along the time axis; this long-term process is irreversible. 'Reduction' does not apply, however, to the amount of articulatory effort displayed in conveying a given idea.¹⁰ Although variable, to be sure, this amount will only oscillate, i.e. be subject to reversible alterations.

Conversely, the notion of semantactic augmentation refers to the number of diachronically identifiable units selected for a given communicative purpose. Only in this particular sense is it correct to say, e.g., that 'Classical Latin HODIE was replaced by AD-ILLUM-DIURNUM-DE-HODIE (> Fr. *aujourd'hui*)'; it would, of course, be preposterous to pretend that the above ten-syllable monster was ever employed in real communication for conveying the idea of 'today', and yet we do not mind saying that *aujourd'hui* goes back to AD-ILLUM-DIURNUM-DE-HODIE, or, vice-versa, that this latter phrase is the etymological ancestor of *aujourd'hui*.

This particularly illustrative example, far from being an isolated datum, stands for a host of similar, though less spectacular, cases. The law that lies behind them is a statistical, not a deterministic one. Counterexamples are sure to be found (the shorter the time-span that is taken into consideration, the more easily, because of reversible short-term processes (oscillation) independent of irreversible long-term processes which underlie the law of phonetological reduction plus semantactical augmentation. What matters is

¹⁰ H. Lüdtkke, 'Sprache als kyb. Phän.' (see fn. 2), p. 48.

the *trend* – the total outcome.

From the above evidence it is not difficult to surmise that some sort of *compensation* occurs with the effect of neutralising the otherwise destructive effects of either process. If we try to state in quantitative terms what we observe to have happened in the language of Isle-de-France between Julius Caesar's and our own time, to the device made use of for conveying the idea of 'today', we find:

- phonetological reduction, as measured by the number of syllables, 3:1 (HODIE > *hui*) or 10:3 (AD-ILLUM-DIURNUM-DE-HODIE > *aujourd'hui*);
- semantactic augmentation, as measured by the same yard-stick, 3:10 (HODIE → AD-ILLUM-DIURNUM-DE-HODIE);
- no significant change in the amount of articulatory effort displayed in conveying the idea of 'today': three syllables in HODIE as well as in *aujourd'hui*.

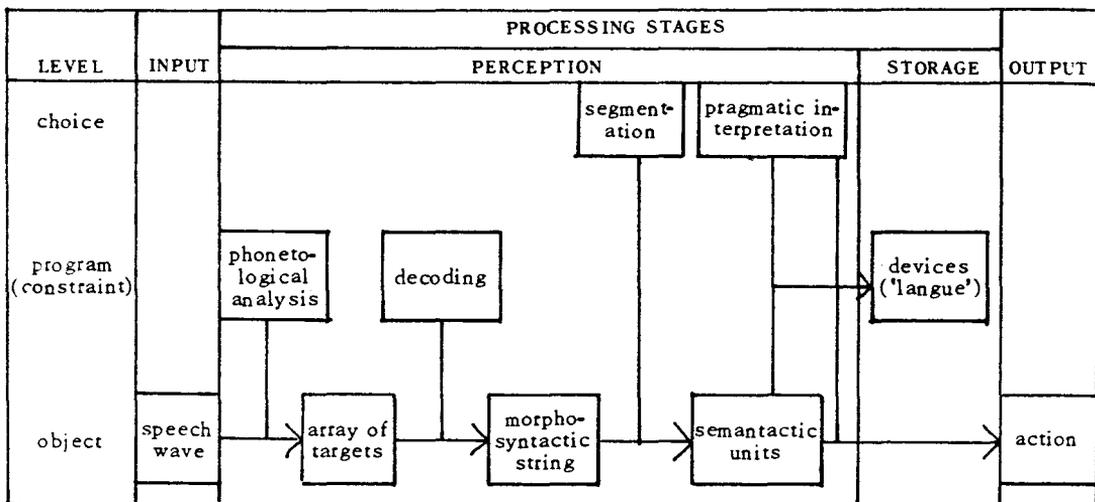
It goes without saying that compensation can be illustrated, but not demonstrated, by a single well-chosen example, for the simple reason that – as a conjoined outcome of two long-term statistical processes – compensation, too, occurs as a *statistically* valid phenomenon, i.e. requiring a sufficient amount of data to be significant.

Following this train of thought, one might arrive at a paradox if semantactic augmentation were measured not by the number of syllables, but instead, by the number of properly semantactic units. While HODIE may be analysed into three constituent parts, viz. HO 'this', DI 'day', E 'abl. sg.', *aujourd'hui* would appear to consist of *a-* 'to', *-u* 'the', *j-* 'day', *-our* '-ly', *d'* 'of', *-hu-* 'this', *-i* 'day'. The relation being 3:7, one might conclude that, as time goes on, the number of semantactical units required for a given communicative purpose increases irreversibly. On the other hand, since the phonetological output (i.e. the corresponding speech-wave) remains at a more or less constant length, there would be an irreversible increase in the number of units per time unit. That implies that every particular unit (statistically speaking) diminishes gradually but constantly in size, tending to become infinitely short – which is an absurd conclusion.

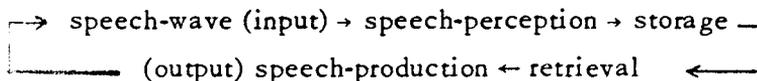
The obvious solution to the problem is: *merger*. It is evident that *j-* and *-our* in *jour* or in *aujourd'hui* can be identified as separate entities by a Modern French speaker on etymological grounds only; otherwise, *jour* is *one* semantactic unit. Not less obviously, a

speaker who lived 2000 years earlier could easily split DIURNUM into DI-URNUM because of synchronic evidence (NOCT-URNUM / DI-ES, DI-ARIUM, etc.). There then arises the problem of how to account for merger as part and parcel of language change, i.e. as a specific irreversible process that cannot be derived from our schematism of speech production.

An important part of the business that we have left out of consideration so far is the perception of speech, or the hearer's activity in communication; it can be schematised in the following way:



The speech wave is phonetologically analysed into an array of targets, which is decoded into a morphosyntactical string, which is segmented into a set of semantactic units, which undergoes a pragmatic interpretation. In its final stage, the processing of the speech-wave has a twofold effect: upon the outside world as (possibility of) action, and inside the brain, as *storage*, i.e. addition to, or modification of, the set of expressive devices ('langue') which in turn are necessary for speech-production. Thus, both – in themselves complex – processes (i.e. perception and production) may be viewed as constituent parts of a cybematic speech circle:



The speech circle is an *open* system, in that two of its constituent processes involve *choice* (which – in a cybernetic sense – means nothing else but openness to outward influence).

The definition of language (= speech) change with reference to the above cybernetic circle runs as follows: *change occurs wherever choice comes in*; that means: through motivation, pragmatic interpretation, establishing of semantactic units, segmentation, and target-actuation. Three of these sub-processes belong to the production, the remainder (segmentation and pragmatic interpretation), to the perception, of speech.

Change through segmentation, i.e. *merger*, must be explained as a gradual, irreversible shift in segmentation habits from greater to lesser degree of analytic activity. This implies that the hearer chooses – at least in borderline cases – between segmenting or not segmenting a given morphosyntactic string at a given point.

In this way, we account for the possibility, though not yet for the necessity, of irreversible shifting in the direction of mergers.

4. Toward an explanation of irreversibility

One of the basic facts that characterise linguistic communication is *redundancy* in the message. We can take it for granted that redundancy is a prerequisite both of variability in the communicative devices and of the possibility of acquiring them through exposure to communicative activity. Systems that lack redundancy are either not acquired or artificial; all of them are rigid, i.e. not liable to intrinsic change.

The general notion of redundancy, as used in information theory, becomes vague as soon as it is applied to language, because it may refer either to the content of the message (with relation to the receiver's previous knowledge) or to the properties of the signal, or to both indiscriminately. In view of this ambiguity and of the two-level structure of language (*double articulation linguistique*), we should distinguish three kinds of redundancy, viz. *cognitive*, *semantactic*, and *phonetological*.

The existence of semantactic and phonetological redundancy in language involves an additional physical effort that is displayed in every act of speech production; such is the price that has to be paid for having man's communication system function, and keep functioning, the way it actually does.

Both these kinds of redundancy are provided for by constraints, viz. structural limitations in the morphosyntactic string and – on the level of phonetological coding – failure to consistently utilize the shortest (or easiest) target arrangements available for representation.

The optimal requirement for a speech act would be for the sound-wave produced to contain exactly as much signaling-negentropy (i.e. encoding-specificity) as the hearer needs to be able to deduce just the amount of information from it which is necessary for understanding the message. This aim could never be reached through built-in redundancy devices but only through the sort of individual adaptive behavior that regulates the amount of signalling-negentropy.

Negentropy-regulation is constantly achieved by a twofold choice: along with establishing semantactic units and with target-actuation. In the latter stage of the speech-production process, regulation is mainly quantitative, i.e. moving from a specific target maximum toward zero. The regulatory movement is, to be sure, reversible, but it is limited on one side by the target maximum (which cannot be overshoot, since there would be no coding-convention for additional targets); while on the other side, i.e. toward zero (= complete slur), the regulatory movement is limited only through the speaker's discretion.

On the other hand, if an increase in the amount of signalling-negentropy is in fact wanted, this can be achieved by augmenting the number and/or size of semantactic units established. This regulatory movement, too, is reversible and has a one-sided limitation, though at the minima. To give an example: there is a smallest possible unit constituting a noun phrase, viz. the anaphoric pronoun; this may be replaced by a larger unit, e.g. a noun, and this in turn by noun+X, where X is a recursive item that can be expanded indefinitely.

Thus the two devices that regulate negentropy are *complementary* and *opposite*. It seems reasonable, therefore, to think of a causal connection between negentropy-regulation in the speech act and long-term unconscious change in language. Indeed, both consist of two opposite, complementary (compensational) processes: phonetological reduction and semantactic augmentation.

5. Chance and necessity

Type-two (i.e. long-term unconscious) change may be viewed from two different angles: (i) as a gradient or scalar process, it primarily consists in shifting both the syntactic minima and the phonetologic maxima in the direction of less extreme values; (ii) as a succession of steps, it consists in the successive loss of more and more former minima and maxima. These two statements are different formulations of one and the same continuum of events; they

both imply that change follows two opposite one-way paths.

Can a long-term process that proceeds along predetermined lines be due to chance? Or, can it be due, not to chance, but to some sort of 'collusion', if its performance takes many generations to become noticeable? Given this dilemma, the most plausible hypothesis would appear to be one that combines chance with necessity. According to these considerations, language change may – over a sufficient stretch of time – be viewed as the *cumulative* effect of a very great number of chance shifts.

This formula leaves room for the inclusion of all sorts of conscious – haphazard or optimizing – contributions to the alteration of a given state of a linguistic system. On the other hand, it calls for some more precise statement as to what is meant by cumulative effect or *accumulation* and how it comes about.

In a trivial sense, accumulation simply denotes the summation of (heterogeneous) facts. The real problem lies elsewhere: How are we to account for the kind of accumulation of small steps that leads in a predetermined direction? A solution can be arrived at if we accept the following premises:

- language is a labile system, viz. devices which constitute a potential for communication which is constantly rebuilt through activation;
- the frequency of use of linguistic items may vary haphazardly;
- the regulation of negentropy runs up against one-sided limitation.

In a 'relativistic' framework like the one sketched above, for an item to exist in a given language (at a given time) means to have a frequency (of use) greater than zero; whereas to be eliminated (or fall into disuse) – diachronically speaking – means the same as to suffer a frequency drop from n to 0 .

This consideration applies not only to such easily identifiable units as those which correspond to dictionary entries in writing, but also to items such as phonetological maxima and syntactic minima and whatever points on the scales of reduction and expansion. Now if some non-extreme item gets lost through temporary disuse, it can always be retrieved by the application of the particular rule of reduction (or expansion, as the case may be) that generates it from the corresponding maximum (or minimum). Only the extremes, i.e. phonetological maxima and syntactic minima, themselves exist independently of rules, viz. as items of coding and patterning. If they chance to be disused for some time, they disap-

pear and are irretrievably lost. When this happens, the next points on the scale take their places as the extremes that then obtain. The next accident eliminates them; so that the language moves along predetermined one-way paths – actuated by chance plus necessity.

6. Language change, biological evolution, and thermodynamics

The summing up of chance events in unidirectional long-term processes is not peculiar to language, but has its counterparts in the biosphere and in thermomechanics. According to J. Monod,¹¹ biological evolution from the single-celled organism to *homo sapiens* (or any other highly complex species) is a statistically irreversible process due to a great number of chance events; therefore, evolution may be viewed as an expression of the second principle [*scil.* of thermodynamics] in the biosphere.

As regards the epistemology of language change, any comparison of linguistic with other facts cannot yield fruitful results, unless we take into account the two-level structure of language.¹² If, with this proviso in mind, we endeavour to relate the irreversible processes encountered in language change to apparently similar ones in the other spheres, we will then be induced to draw a parallel between phonetological reduction and what happens in closed thermodynamic systems: increase in entropy (= decrease in negentropy) in both cases. On the other hand, semantactic augmentation involves not only the immediate physical opposite, i.e. increase in (signalling-) negentropy, but also a gain in some higher-order complexity which is comparable to the process of biological evolution toward greater specificity. What is peculiar to language is that the two phenomena – either of them unidirectional, irreversible – form part of a still higher-order mechanism that warrants homeo-rhesis. For language changes only to remain unaltered.

7. Linguistic relativity

In a static epistemological framework, the existence of units is logically prior to the existence of properties, because properties are assigned to units and are thus properties of *them* (e.g. velocity in classical mechanics: a property of bodies). A dynamic or rela-

¹¹ J. Monod, *Le hasard et la nécessité* (Paris, 1970), p. 139.

¹² A. Martinet, 'La double articulation du langage', *La linguistique synchronique* (Paris, 1968), pp. 1-35; H. Lüdtke, 'Considérations sur les théories phonétiques', *La linguistique* 7 (1971-2) 139-143.

tivistic framework has it the other way round: the property of something to be a body, in the Einsteinian paradigm, depends upon its velocity – in relation to something else – being significantly lower than c (light velocity).

Something similar may be said about language. While in the traditional paradigm of linguistics (from Aristotle to De Saussure, Chomsky, and their followers), identified units pre-exist and are characterised as such, e.g. by their phonetological representations and by their frequencies of occurrence in speech; in a relativistic framework, contrariwise, existence or identity or 'being a semantactic unit' itself depends on, i.e. is a function of, a dynamic quantity, viz. the *product of size* (of phonetological representation) *and frequency* (of occurrence in speech).

This formula means that the number of units in a morphosyntactic string is in probabilistic co-variation with the product of size and frequency of that particular string, so that the probability of *segmentation* increases and that of *merger* (= non-segmentation) decreases along with the increases of the product of size and frequency. Now since the size (i.e. phonetological representation) of any given morphosyntactic string irreversibly decreases along the time axis, it follows that the product of size and frequency, too, will decrease, unless there happens to be a rise in frequency (which occurs as an exception, not as a rule). The resulting effect is a constant probabilistic merger intensification, as time goes on, because of chance plus necessity.

The dynamic formula admits of additional interpretations. If the status of semantactic unit depends on frequency X size, small-sized units will tend toward high frequency; and vice-versa, very frequent units toward small size; thus Manczak's Law¹³ can be deduced from our formula. But, since size decreases in any case through a natural irreversible process, irregular shortening as explained by Manczak is the exception rather than the rule. On the other hand, since an increase in size can be obtained through semantactic expansion (i.e. mostly addition and juxtaposition of other units), small-sized units not sustained by high frequency tend to merge with neighbouring ones, thus losing their identity. The alternative is elimination through disuse, which equally means loss of identity. There is no escape: in the long run (however long it may be),

¹³W. Manczak, 'Le développement phonétique des langues romanes et la fréquence', *Universitas Iagellonica. Acta Scientiarum Litterarumque* CCV (KRAKOW, 1969), p. 18 and *passim*.

owing to phonetological reduction, every semantactic unit is doomed.

8. Item vs. system

While individual units succumb, linguistic species (*langues*) survive, i.e. continue to function as communicative systems. This is another striking parallel with what happens in the biosphere.

In language, decline and/or disappearance of items through irreversible processes is not limited to semantactic units but applies to abstract ('grammatical') organisational devices as well, such as number, gender, etc. Conversely, just as new semantactic units continually come into existence through mergers, new organisational devices also arise; the question is: how?

An important part of the answer has already been given by T. Givón¹⁴ who shows that there is an endless morphological cycle of rise and attrition, i.e. a law which has it that yesterday's syntax is today's morphology, which will in turn be lost tomorrow, to be eventually replaced by what is syntax today... etc.

What is traditionally called inflectional morphology and word-formation differs from syntax in respect to two properties, viz. *restriction* and *non-recursivity*. What is meant by restriction can be learned from the comparison of the following French examples of verb+verb combinations: *venir de danser* 'to have just danced' – *finir de danser* 'to finish dancing'.

unrestricted pattern

ils finissent de danser
ils finissaient de danser
ils finiraient de danser
ils ont fini de danser

etc.

restricted pattern

ils viennent de danser
ils venaient de danser
*ils vinrent de danser
*ils sont venus de danser

Obviously, *venir de* + inf. is being morphologised, the same as *aller* + inf. (with similar restrictions on its use in the sense of 'to be going to'), while hundreds of other verb+verb combinations so far remain syntactical.

After these considerations, it will be evident that at one end of what is rather a chain than a circle there is phonetological reduc-

¹⁴T. Givón, 'Historical Syntax and Synchronic Morphology. An Archaeologist's Field Trip,' *Papers from the Seventh Regional Meeting of the Chicago Linguistic Society* (Chicago, 1971), 394-415.

tion, which causes a given morphology to disappear, while new morphological devices come into being – through the restriction of combinatorial freedom and the cessation of recursivity – out of syntactic patterns. What is common to both syntax and morphology is *hierarchy* of combination. Then, of course, the question may be raised as to what hierarchy stems from, i.e. what is at the other end of the chain. The answer is: *differences in frequency* among semantactical units. Created through motivation (see ch. 3), such differences do not derive from an intrinsic source, but from all sorts of outward influences upon man's communicative activity.

9. Quantitative vs. non-quantitative change

When language is treated as if it were an intricate gear made of cog wheels that move incessantly along predetermined lines, the suspicion might arise that this is either not the truth at all or at least not the whole truth.

The latter assumption is the right one. It has been our endeavour to isolate the purely quantitative part of what is really a much more complex set of processes. It must go without saying that every step in a predetermined direction does not proceed along a predetermined *line*, but within a predetermined *spectrum* – which means that it involves some choice. This can be illustrated with the following imaginary example: A linguist living in Rome 2000 years ago, yet equipped with our present theoretical knowledge (together with some prevision or happy guesswork about history), would have been able to predict the host of Romance descendants of Latin

CLAVEM

chave llave clau clé clav chiave kluf cheie,

together with many others (whether existing or hypothetical) as possible later reflexes – but to reject, say, **aculaveme*, as an impossible one, on account of the law of phonetological reduction; whereas no prediction could have been made as to *where* any given one of all the possible forms might be actually met with 2000 years thence.

What holds good for reduction also holds good in a still larger measure for augmentation: choice is involved in each link of any unidirectional chain.

A special issue concerns the order of phrases in sentences and

of lower-order units within phrases: here, choice is severely limited by the principle of linearity (serial arrangement).¹⁵ On the other hand, it seems that no law relating to linear ordering can be deduced from our theory.

10. Language universals

Language universals in a wider sense, i.e. the set of imaginable properties of *langage*, fall into three classes: necessary, contingent, and inadmissible (= negative).

Language universals are *eo ipso* universals of language change. In other words, there are the following pairs of convertible statements:

(i) necessity: (languages have X) ~ (X is not subject to change);

(ii) impossibility: (languages lack Y) ~ (Y is not the result of any language change);

(iii) contingency: (languages may have Z) ~ (Z may both originate and disappear through language change).

Analogous considerations hold for frequency or probability of occurrence in different languages: properties that have a high probability of originating as the result of language change also tend to have a high frequency of occurrence among the languages of the world; and vice-versa.

The two kinds of formulas, although convertible, are not equal in status: in a relativistic framework, dynamic statements must have priority.

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¹⁵R. Bartsch and Th. Vennemann, *Semantic Structures* (Frankfurt/Main, Athenäum, 1972); Th. Vennemann, 'An Explanation of Drift', *Proceedings of the Symposium on Word Order and Word-Order Change*, (Univ. of California 1974) ed. by Ch.N.Li).