On the Nature of Time
A Biopragmatic Perspective on Language, Thought, and Reality

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Abstract


This book is a synthesis of more than three decades of research into the concept of time and its semiotic nature. If traditional philosophy – and philosophy of time should be no exception – in the shadow of advancing biology can be said to have reached an impasse, one important reason for this, in harmony with Wittgenstein’s vision, appears to have been its lack of appropriate tools for explicating language. The present theory of time proceeds, accordingly, from the exploration of temporal expressions in language as an evolutionary fact. It derives in a hypothetical, coherent feedback process of hierarchically ordered distinctions the semantics of time from its biologically dictated perceptual and cognitive-pragmatic origins.

The corresponding abductive-regulative model is anchored in the assumption of biological rhythmization as the very foundation of perception and mental/physical action. Understood to originate in space and spatial perspective, time reveals itself as an instrument for temporal perspective on motion (events and situations) in a process of analysis, i.e., discontinuation of chaos made divisible and continuous by the rhythmical screen. Whereas traditional philosophy of time paid attention almost exclusively to the temporal category of tense, the biopragmatic model sees strong evidence in the perspectival nature of time for ascribing the decisive, and probably universal, role in temporal analysis to the linguistic category of aspect.

Aspect may, according to the present findings, be assumed to partake already of change-of-state and cause-effect analysis without which man’s adaptation to new situations – and precondition for survival – would be inconceivable. The proposed model of space/time cognition, inspired by Hegelian dialectics, Heidegger-Gadamer’s hermeneutic circle and Peircean logic, makes Kantian a priori superfluous and liberates time from its enigmatic appearance.

For the first time in temporal studies it thus appears possible to derive hypothetically linguistic expressions of time all the way from pretemporal, homogeneous continuity effected by biological rhythmization, via pretemporal metonymic (Gestalt), chunk-wise partitioning – as a general precondition for the perception and, based on primary metaphorization, the cognition of things, space and motion – to temporal analysis/discontinuation proper, primarily by aspectual perspective, and the subsequent synthesized, heterogeneous continuity of temporally ordered events. The conception of time, so disastrous for modern temporal logic, i.e., as moving object assigned extension, divisible continuity (‘linearity’) and direction, can be shown to have emerged as a result of secondary metaphorization.

Keywords: theory of time, philosophy of time, biopragmatism, perspectivism, linguistic semiotics of space/time, perceptual-cognitive and pragmatic foundations of time semantics, aspect-tense-taxis trichotomy of temporal perspective.
For Karina
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The apprehensions of the death of philosophy uttered at the end of the 20th century by Willard van Orman Quine and Georg Henrik von Wright, among others, were, as far as we may judge today, apparently exaggerated. Ludwig Wittgenstein’s vision of philosophy as a discipline that makes itself superfluous by explicating language is also, as we know, still far from becoming reality. When other philosophers like Jacques Derrida and Richard Rorty proclaimed the end of philosophy this was their way of bidding farewell to the Platonic idealization of human rationality. In reality the issue was how to transform philosophy in order to avoid its fading away in the shadow of the advancing empirical sciences, biology in particular. The reason why philosophy had indeed reached an impasse was precisely its lack of appropriate tools for explicating language. Wittgenstein was basically right. This task could not be achieved by the isolated system of logical analysis as assumed by a positivist philosophy of language. According to the philosophy of bio-pragmatism advocated in the present work, prerequisites for the fulfilment of this task are at hand merely if language is conceived as integrated with a biologically and socially founded system of cognitive processing in permanent circular feedback with perception and action/interaction.

The phenomenon of proclaiming the end of philosophy, or of history for that matter, has a parallel in the alleged crisis of linguistics. That this phenomenon is a matter rather of the petrification of existing methodology and the inability to recognize the appearance of paradigmatic shifts was attested, for example, by Jürgen Habermas’ New Paradigm in philosophy (see Ch. 1), and in linguistics by postgenerative developments toward the cognitive (cognitive-pragmatic) and biological foundation of language. Opposed to the vogue of pessimism in ‘autonomous’ philosophy and linguistics is the wave of optimism and eagerness of inquiry aroused by the insight that access to new knowledge is often warranted in interdisciplinary cooperation alone. This cooperation has found its expression in the progress of such directions of research as psycholinguistics, cognitive semantics, cognitive (cognitive-pragmatic) linguistics, biolinguistics, neurolinguistics, neurobiology, neuropsychology, cognitive neuroscience, among others.

In the light of these developments it becomes evident that the traditional distinction between a philosophy of mind and a philosophy of language can hardly be upheld in any meaningful way. A philosophy of language presupposes its integration with a philosophy of mind, and vice versa. More im-
portantly, both require a foundation of plain linguistic analysis. The interaction of language and thought with perception and action in an overall processual model likewise makes distinct philosophies 'of perception' and 'of action' less likely. Such a holistic-coherentist view does not render philosophy superfluous. On the contrary, its task would be to define more explicitly the interacting components that philosophy is supposed to survey and coordinate from its superordinate perspective of epistemology. The latter should, according to the framework proposed here, be based on a philosophy of biopragnatism and a general theory of signs. It appears natural to acknowledge at this point the impact on my outlook on the workings of language that has been exercised by Peircean pragmatism and semeiotic.

This is a book about the concept of time as a linguistic and philosophical problem written by a linguist. The reader may ask – and rightly so: What can be said about this ancient issue that has not been said before? One of my underlying philosophical assumptions is that if we can say something meaningful about time, then we might as well be able to say something more meaningful about being and its relation to time than was possible in a Heideggerian ontology. That is, by studying the subject acting in, perceiving, and cognizing temporally a world that exists by virtue of constant changes of state we might get an idea of the preconditions for man’s knowledge in general. From this point of view it would indeed be justified to understand time’s relation not to being but to becoming as the more significant one. Another assumption is that traditional philosophy of time did not pay due attention to language – the only access there is to human thought. That the latter assumption is well-founded transpires from the fact that philosophical studies of time to this day have restricted themselves to the linguistic category of tense. This book presents an attempt to explore the prerequisites for a general theory of time based on the cognitive primacy of the linguistic category of aspect. This aspectual renewal of temporal research, which emphasizes the pivotal role of perspective not only in the cognition of time but in knowledge in general, originates in the linguistic discipline of aspectology as it has developed from the beginning of the 20th century to this day.

The integration of recent cognitive-pragmatic research into aspect with philosophical studies of time indicates that it is precisely in this category that we are likely to find the key to a novel understanding of the essence of time. Most people have probably, more or less unconsciously, come across aspect merely in the shape of, for example, the distinction between continuous and simple forms of the English verb or between passé simple and imparfait in French. In reality one would assume that under the incidental surface of the frequently polysemous morphology of verbs (or other linguistic means) there hides an ingenious system of perspectival distinctions that – in one way or another – may be expressed in most languages and, accordingly, are due hypothetically to perceptual-cognitive processing of a universal nature. Perspective is something we take for granted when we are concerned with the
perception of things ‘in space’ but not necessarily when it comes to time, although the latter – as we shall see – may be derived by a logically coherent, hierarchical process from space, more specifically from the motion of things ‘in space’, viz., as a definite perspective on events.

The significance of the category of aspect for the emergence and meaning of time had evaded most prominent students of time, even those who used this category in their own mother tongues, like St. Augustine, Charles S. Peirce, and Henri Bergson. Albert Einstein, like Aristotle and Augustine before him, had stumbled against the exceptional nature of the now, demonstrated by its irreconcilability with the predominant idea of time as measure, without realizing that this had to do not with tense but with the aspectual essence of present time (see 3.12). Closest to a perspectival understanding of time were, as will be demonstrated below, separate observations made by Aristotle, Spinoza, Bergson, and von Wright.

An important consequence of founding a theory of time on the linguistic category of aspect is the imperative revival of the philosophy of perspectivism. Far from being a discovery of postmodernism, this philosophy has a long – but quiet – history. It was obviously suppressed by the Enlightenment and philosophical positivism but it has survived – apparently to undergo its full rehabilitation in our time. Actually, it can be traced back to early Indian philosophy, to Protagoras’ thesis of homo mensura and to Leibniz’s monadology. Its most famous representatives in modern time are Friedrich Nietzsche, José Ortega y Gasset, and Karl Popper. Hans-Georg Gadamer’s recognition of prejudices as a natural constituent of human rationality and knowledge certainly pertains to this tradition of perspectivism as well.

According to this reasoning it is no coincidence that perspectivism neatly fits the variation-selection principle of evolutionary biology. It is the individual perspective, in a broad sense, that determines the subject’s choices on every single level of decision-making all the way from primitive levels of biological processing to levels of sensorimotor, perceptual-cognitive, and linguistic processing. This principle can also be said to pertain naturally to the socio-cultural levels and, for that matter, to the theoretical metalevel of the cognitive-linguistic model proposed here. That is, a selection of previous work in the field to be considered is inevitable, namely from the perspective of the most prominent assumptions underlying (developing within) the proposed model: hierarchical cognitive processing in circular feedback with perception and action, the interaction of subjective perspective with cognitive-linguistic intersubjectivity as the foundation of knowledge, the cognitive origin of time in space, i.e., spatial perspective, and the corresponding primacy of aspectual-perspectival distinctions in the concept of time.

The great challenge of perspectivism to traditional theories of knowledge is the need for models accommodated precisely to the hierarchical-processual interaction of subjective perspective with cognitive-linguistic intersubjectivity (Ch. 1). According to the position taken in the present work,
such interaction is conceived as taking place in the overall model of permanent inductive-deductive processing regulated and coordinated in a hierarchical fashion by superordinate abduction in circular feedback with perception and action, including linguistic action/interaction (see 3.2). This model of abductive epistemology draws on my reinterpretations of Hegelian dialectic and Peircean logic but also of Heidegger-Gadamer’s hermeneutic circle. It thus represents a basically perspectival and hermeneutic-constructive understanding of knowledge and its emergence. As distinguished from ‘bad circularity’ in theoretical argument we are concerned here with ‘good circularity’ or, as Francisco Varela called it, “creative circularity”, responsible mainly for the constant feedback of cognitive processing with input sensory data. The task of perspective-based selection is carried out by abduction. Within this general model (see 3.2) I suggest the integration of the specific ontogenetic/synchronic model of space/time cognition (see 3.16, 8.4). Time is derived by successive metaphorical transformations from space and motion. The interpretative-constructive model, applied not only to time but also to space, makes Kant’s a priori conception superfluous with regard to both categories. The cognitive-linguistic derivation of the specific kinds of temporal-perspectival distinctions (aspect, tense, taxis) is integrated, in turn, with the model of space/time cognition.

The cognitive primacy of the temporal category of aspect is attested by its compound spatial/temporal nature demonstrated by the aspectral distinctions foreground vs. background and totality vs. partiality, as well as by its presumable origin in universal Gestalt perception and metonymy (see 3.8). In this light it becomes clear that time has to do primarily with the perception and cognition of situations and events, more specifically with the aspectral perspective applied to them in the analysis of change-of-state and cause-effect (see 3.13, 5.5, 5.6). Time is shown to be discontinuous in its essence. It analyzes the continuous screen that attention, by means of endogenous rhythmical stimuli, superimposes onto chaos. Time thus emerges as the discontinuation of this non-temporal biological continuity for the purpose primarily of discerning (potential) changes. Accordingly, the conception of ‘moving time’ is shown by the coherent hierarchical-processual model of space/time cognition to be the outcome of a superficial metaphor taking place after temporal analysis proper. This finding explains to a great extent the dilemma of traditional temporal logic. It also sheds light on recent attempts to found a theory of time on this problematic conception (Ch. 11).

With access to the accumulated knowledge about the biopragmatic and cognitive foundations of language, linguists today are not only in a position to revise decisively the traditional philosophy of space and time; in the conception of space and time as human constructions for perspectival analysis (manipulation) they also have at their disposal one of the weightiest arguments against all objectivist kinds of realism.
The present book may be understood as a 'synthesis' of temporal research carried out over a period of roughly three decades. Such a 'synthesis' is, of course, subject to the same procedure of selection that characterizes every single stage of analysis in cognitive processing. Although the selection for this presentation is of a superordinate nature, the reader is requested to conceive of this 'synthesis' merely as an attempt to fix artificially the current phase of a movement described by the permanent circular feedback interaction of analysis-synthesis. From the foregoing it should be evident that this 'synthesis' or methodological and theoretical state of affairs, reflected by the model, together with its implicit choices, of necessity derives from my personal perspective. The reader is, in a corresponding way, invited to make his/her own 'synthesis' by analyzing the evidence brought forward from his/her perspective. The inevitable individual variance in perspective and analysis-synthesis is the very precondition for choices that justify refutations and the advancement of new conjectures – given the communicability, i.e., cognitive-linguistic intersubjectivity, of this variance.

The selection and integration of previously published contributions (Ch. 3, 4, 5, 7, 8, 9) – focusing in the present book on overriding philosophical and universal cognitive-linguistic implications rather than exhaustive language-specific corpus analyses – has required a revision and updating in order to harmonize them with the newly written parts of the book (Ch. 1, 2, 6, 10, 11, 12). The latter are meant to assume in part the role of supporting the 'synthetical' reading. This role is played more pronouncedly by the Conclusions (Ch. 12), the chapterwise Summaries, the conceptual frame of reference outlined above (and explicated in detail below as the model develops; for a convenient first acquaintance the reader is referred especially to the Summaries of Ch. 1, 2, 3 and 5), the ample cross-references throughout the book, as well as the detailed Index of topics. The strategy of presentation suggesting a 'synthetical' reading, but equally offering access to singular analyses, leads occasionally to inevitable repetitions. These have not been removed in cases where they are justified by a different context and/or assumed to facilitate the separate reading of a chapter. The headings of the chapters in the above Table of contents and the following Survey are assumed to ensure the reader a general idea of the thematic order of presentation. The headings of the sections, in addition, are intended to guide the reader – often quite in detail – to the particular topics subsumed in the given thematic content of a chapter.

The Logical and Thematic Development of the Book: A Survey

From the chosen biopragmatic position, Chapter 1 presents a critical outline of the philosophical background for a theory of knowledge reconcilable with temporal research. Such a theory is understood to include of necessity pro-
cesses of perception and action and, accordingly, the perspective of the perceiving/acting subject as part of its foundation. The integration of subjectivity with cognitive-linguistic intersubjectivity is advanced as a central problem and the great challenge to contemporary epistemology. As indicated by the nature of time cognition, a theory of knowledge requires an account of perceptival variation and selection on every single level of perceptual, actional and cognitive processing, forming the point of departure for cognitive-linguistic invariance. **Chapter 2** develops further these assumptions within an evolutionary approach to knowledge but questions Konrad Lorenz’s restrictedly phylogenetic interpretation of time and Kant’s corresponding a priori conception. Alternative hypotheses are advanced about the essentially ontogenetic (or ‘a posteriori’) nature of time and its derivation from space, viz. on the basis of phylogenetic dispositions. Assumed to originate in space, the linguistic category of aspect is recognized as the superordinate meaning of time and adduced in support of philosophical perspectivism. Erich von Holst’s discovery of the endogenous production of rhythmical stimuli is treated as the biological foundation not only for the motor activities of various species but also, and most importantly, for human space and time cognition. Time – along with space – is highlighted as the most efficient tool that evolution, that is, phylogenetic dispositions in permanent interaction with ontogeny and cultural learning of the pragmatic and cognitive-linguistic heritage, has developed for man’s adaptation to new situations. In **Chapter 3** the biopragmatic position is underpinned further by the biological foundation of cognitive-pragmatic models of language semiosis. Natural selection on a teleological footing is assumed to be reflected on the various levels of perceptual, actional and cognitive-linguistic processing by selection from a variety of hypothetical rules according to the perspective of the given subject. According to the suggested interpretation, such processing takes place in a circular feedback fashion and is governed by abduction as the superordinate regulative device for hypothesis-formation in cooperation with induction/deduction. By taking a creative part in perception, abductive hypotheses, accordingly, are assumed to assign to all acts of perception a definite perspective on the world, including a spatial and a temporal one. The proposed model starts with biological rhythmization, which assigns divisibility (phasality) and continuity to chaos. On this basis space and time are demonstrated to be derived successively in a process of perceptual-cognitive metaphors and to identify objects by partitioning (discontinuation). Understood to represent acts of selection, the latter procedure (the two concepts are used below as synonymous expressions of *analysis*, although “partitioning” is preferred for superordinate chunk-wise selection) is regarded as the fundamental perceptual-sensory and cognitive strategy for the individuation (objectification) of things and events in chaos. Gestalt and pattern matching perception, as well as the aspectual perspective of events in terms of totality vs. partiality, as means of discontinuation, cooperate with superordinate par-
titioning by way of processual feedback, in particular in change-of-state and cause-effect analysis. The objective of Chapter 4 is to confront the theoretical assumptions emerging from the cognitive-linguistic study of time, especially the category of aspect, with the proposals advanced by the philosophy of time in the course of its long history. One general outcome of this confrontation is that time as both experientially and rationally motivated perspective can hardly be reconciled with the absolute epistemological dichotomies of traditional philosophy. Rather, it indicates that the latter (to the extent that they are still justified at all) are characterized by a high degree of integrative overlap. This applies thus to the 'cooperation' of (embodied) experience and rationalization but also to our conception of reality and its relation to human thought ('ideas'). Conceived as cognition, the latter would indeed comprise rationalization and thus demonstrate the deficiency of the traditional distinctions between empiricism vs. rationalism, on the one hand, and realism vs. idealism, on the other. If we still use the notion of realism, the approach to knowledge implied by the perspectivist project in linguistic semiotics might be characterized as biologically founded cognitive-pragmatic realism. The historically 'enigmatic' nature of time is demonstrated to have its origin mainly in difficulties to trace its hierarchical and processual emergence from space and to distinguish between the different levels of metaphorization involved. The most prominent outcome of this condition is the dominating idea of 'moving time' and its fatal consequences for the history of temporal studies, in particular for the understanding of continuity vs. discontinuity and the proper relation of this distinction to temporal perspective. Against this background a novel attempt to analyze Zeno's paradoxes is undertaken. The cognitive-linguistic working of time is presented in terms of the three categories aspect, tense, and taxis. Chapter 5 develops further the analysis of the superordinate temporal category of aspect by confronting it with the theory of signs proposed by Charles S. Peirce, the main inspirer of the cognitive-pragmatic view taken in the present work. This analysis is shown to find empirical support in Peirce's typology of signs (symbol, index, icon) and his explication of the trichotomies of universal categories (Firstness, Secondness, Thirdness) and of signs (qualisigns, sinsigns, legisigns), as well as his distinction between percept and perceptual judgement. In contrast to the view (implicitly or explicitly) held by Roman Jakobson and others, it is not Peirce's notion of icon but rather that of index (viz., temporal index) that plays the decisive role in the cognitive semantics of aspect. In harmony with Peirce's categorial distinctions, a cognitive-linguistic model for the derivation of aspect expressions is suggested on the basis of the phasality vs. non-phasality distinction and considerations of change-of-state conditions. Proceeding from Daniel Birnbaum's interpretation of Otherness in Edmund Husserl's phenomenology, Chapter 6 returns to the theme of intersubjectivity and posits the faculty of empathy (and its neurobiological substrata) as its very foundation. The relevance of perceptual and cognitive
processes implied by the successive emergence and differentiation of the Ego and the Other for the temporal-perspectivist project is indicated by the perspectival nature of self-presence/the Now and the change of temporal, primary aspectual, perspective involved in transcending it, viz., by relating to oneself as the Other and to the Other as oneself. The logical (cognitive) relationship between time and empathy, which may appear non-transparent at first glance, is thus assumed to represent crucial processes at work in primordial human ontogeny. From Chapter 7 we may infer that such processes, among other essential conditions, are outside the reach of the non-perspectival, exclusively tense-oriented approach to time evidenced by the truth-conditional practice of traditional temporal logic. This practice is demonstrated to have led temporal research into an impasse of inconclusive discussions of tensed vs. tenseless truth conditions, ignoring the superordinate temporal meaning of aspect. Under these circumstances not only the perceptual, actional and cognitive-linguistic ontogeny of aspect, including its derivation from space, but also its corresponding hierarchical and processual relations to the temporal meanings of tense (and taxis) remain unaccounted for by temporal theory. Such relations, by contrast, are made explicit in Chapter 8 where attention is paid to the functions of aspect and tense in narrative texts. The perceptual and cognitive prerequisites for a corresponding theory are discussed hypothetically in an outspokenly localist approach deriving time from matter, space and motion. It is demonstrated that St. Augustine’s irresolution as to the problem of time, represented more specifically by the present tense and its incapability of being measured, was caused precisely by his ignorance of the spatial/temporal, i.e. aspectual, nature of the present. As opposed to the aspectual feature of totality, implied by measurement through delimitation in the past or the future, the aspectual feature of the actual present is partiality (partial/phasal reference to an event), logically irreconcilable with measurement. After a detailed presentation of the hypothetical development of temporal distinctions in human ontogeny, attention is paid to functions of temporal-perspectival manipulation in literary texts, and the conclusions that can be drawn from it for the general working of time. Consequently, adequate linguistic models of temporal perspective appear inconceivable without a hypothetical correlation between linguistic data and the interpretations of world structures. Such a correlation, not foreseen by autonomous linguistics, is understood to ensure by way of simulation the hierarchical and processual coherence between perceptually, actionally, cognitively and semantically structured worlds. Against this background it becomes opportune to concretize in Chapter 9 the cognitive-linguistic analysis of temporal expressions. For this purpose the attempt is made to approach anew one of the notorious problems of temporal grammar: the meaning of the perfect and its proper cognitive-semantic nature. In contrast to the traditional issue whether the perfect (i.e., the system of perfect meanings: the present perfect, the past perfect, the future perfect) is an ex-
pression of aspect or tense, the interpretation advanced here identifies it as involving a third, independent temporal category. By further developing Roman Jakobson’s general concept of taxis and revising its still aspect-dependent application to the perfect meaning by Jurij Maslov, the present treatment arrives at the conclusion that temporal grammar has to comprise also a distinct category of taxis. Cooperating hierarchically and processually with both tense and aspect, taxis in the perfect meaning is represented by the temporal-semantic feature of Anteriority. In accord with the philosophically, viz. biopragmatically, founded approach to time and its cognitive-linguistic working as perspective on situations and events, it appears reasonable that the superordinate temporal meaning of aspect, as set out in Chapter 10, would be reflected universally by various linguistic means according to the given language. In contrast to the traditional, morphologist conception of ‘aspect languages’ vs. ‘non-aspect languages’, the proposed aspectual analysis of the temporal conjunctions als, wenn, während in German indicates indeed that this ‘non-aspect language’ is no exception. Accordingly, the assumedly universal cognitive semantics of aspect is demonstrated here to cooperate in temporal conjunctions with syntactic structures, thus partaking of the representation of complex situations of events, including their concatenation, hierarchical ordering, and – in the case of während – parallel occurrence. To propose under such conditions of hypothetical universality a general approach to time that takes as point of departure one single temporal expression in one single language appears to imply an inevitable restriction of the empirical scope and the corresponding degree of explanatory and predictive adequacy. However, as shown in Chapter 11, this is precisely what Vyvyan Evans in a recent work does when he founds his theory of time on the English lexeme time (in various contexts and expressions). The assessment of Evans’ book offers an eminent opportunity to discuss by way of contrast the advantages and disadvantages of different methods in the contemporary study of time and their consequences for the corresponding range of theoretical assumptions. It is hard to overlook the fact that Evans’ primarily lexical-semantic approach, notwithstanding its rich observations and the novelty of many proposals, is not in a position to transcend the restrictedly inductive level of inference and, therefore, renders difficult its integration in a holistic and coherent model of temporal processing, correlating time cognition with the cognition of matter, space and motion. Against this background it is not really surprising that such a theory of time does not recognize time as perspective and, accordingly, pays restricted attention to tense and, notably, ignores the linguistic category of aspect. For a summary of the main arguments brought forward in the course of my entire presentation and the conclusions to be drawn from the framework for temporal research proposed in the present book the reader is referred to the full account in the final Chapter 12.
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Uppsala, February 2014

Nils B. Thelin
1 Knowledge, perspective, and cognitive-linguistic intersubjectivity: An introduction to the philosophical background

Against positivism which sticks to phenomena (’there are only facts’) I would say: no, precisely facts there are not, only interpretations.

Friedrich Nietzsche (1964 [1887]: 337)

The only environment to which the organism can react is one that its sensitivity reveals […] this is the way in which an environment exists […] in this selected character and as constructed in terms of possible responses.

George H. Mead (1937: 245–47)

The elements of every concept enter into logical thought at the gate of perception and make their exit at the gate of purposive action.

Charles S. Peirce (CP 5.212, 1903)

The overcoming of all prejudices, this global demand of the Enlightenment, will itself prove to be a prejudice […] the idea of an absolute reason is not a possibility for historical humanity.


[T]o say “how language relates to the world” by saying what makes certain sentences true […] is impossible.

Richard Rorty (1987 [1982]: 33, 55)

[Philosophers […] are faced with problems whose solution is only possible through intimate co-operation with linguists.

Peter Zinkernagel (1962: 11)

Another wonderful thing about cognitive linguistics is that it leads to an empirically responsible philosophy […]

Mark Johnson and George Lakoff (2002: 262)

1.1 Time, cognitive-pragmatic linguistics, and the New Paradigm in philosophy

The present work is an attempt to explore what can be said about the concept of time as a linguistic and philosophical issue. The basic assumption is that an empirically founded linguistics in a critical dialogue with philosophy (as
"mediating interpreter"; Habermas 1987: 314) hopefully will be in a position not only to make a novel contribution to the philosophy of time but also demonstrate an alternative to analytical philosophy of language. This idea harmonizes with Jürgen Habermas’ suggestion to establish, primarily on the basis of pragmatism and hermeneutics, a "new paradigm" in philosophy in the form of a "cooperative integration of philosophy and science". In this new paradigm of cooperation, linguists, accordingly, would expect to engage philosophers who, while "fallibilistic in orientation, reject the dubious faith in philosophy’s ability to do things single-handedly, hoping instead that the success that has for so long eluded it might come from an auspicious matching of different theoretical fragments" (Habermas 1987: 305, 310, 314).

I hope that the present, biopragmatically founded, cognitive-linguistic analysis of the concept of time and the space-time relationship – in view of their pivotal role for human action, thought and language – shall be demonstrated to represent such a "theoretical fragment" which, confronted with others, may shed new light on human reason, and consequently contribute to advancing the frontiers of epistemology, as well. As an equivalent "theoretical fragment" (harmonizing and in part intersecting with my biopragmatic project; see below), with a corresponding potential impact on the current development of philosophical thought, I would regard George Lakoff and Mark Johnson’s (1980, 1999, 2002) guiding cognitive-linguistic exploration of conceptual metaphor. The crucial role of metaphor for hypotheses about the cognitive origins of time (and space) was one of the important findings to which I was led by studies of the linguistic category of aspect (Thelin 1999, 2002).

From other, mainly empiricist-behaviourist, points of departure Willard van Orman Quine (1961 [1953]: 42; 1960: 275ff.) has suggested a corresponding 'naturalization' of philosophy with consequences which I generally (see below) consider reconcilable with the present biopragmatic approach.

The cognitively-pragmatically oriented reconstruction of the temporal categories of language suggested here, most prominently the so-called aspect category, appears to demonstrate in particular the indispensable need to revitalize the philosophy of perspectivism in order to counterbalance transcendental foundationalism, dialectical absolutism, and analytical positivism. The most promising framework for a corresponding renewal of epistemology (practiced previously in the Platonic tradition of episteme as ‘genuine knowledge’ in contrast to doxa, i.e., 'opinion'; cf. Rorty 1987 [1982]: 27ff.; see 4.6.5) appears to be a pragmatic kind of semiotics in the spirit of Peirce, James and Dewey, as well as its natural companion in the form of hermeneutics, most likely as conceived by Hans-Georg Gadamer (1989 [1975]).

To the extent that my exploration can be understood as reconcilable with Habermas’ New Paradigm it gives support to his suggestion to transform philosophy rather than proclaim its end (cf. Baynes et al.1987). This transformation might, in my view, give rise to a new type of philosophy of lan-
guage that would deserve its name to a higher degree than previously. More intimately allied with linguistics, understood as an empirically founded "reconstructive science" (Habermas 1987: 310), philosophy of language would thus be in a position to claim universal validity by integrating in commensurable ways the logic of language with the logic of thought and action as realized by the community of interacting and communicating subjects. Richard Rorty’s (1979: 390; 1987 [1982]) version of pragmatism, in spite of its justified criticism of transcendentalism and analytical positivism, does not appear to warrant this kind of integration because of its one-sided focus on "social practices of justification" (see the detailed discussion below, 1.17).

Independently of Peirce, Gottlob Frege developed an understanding of logic which, within the framework of analytical philosophy, became the basis for a different kind of orientation toward the analysis of thought through the analysis of language (cf. Dummett 1987; see further below). However, this practice, according to my understanding, was restricted in its potentials of progress to the extent that it, in Frege’s spirit (and in contrast to Wittgenstein), isolated language, and thereby thought, from other kinds of action (interaction), or, notwithstanding pragmatic ambitions (expressed, for example, by the notions of ‘language use’ or ‘speech acts’ in Oxford philosophy), treated language without a systematic coherence with thought. In both cases attention to subjective thought was rejected as ‘mentalism’, and thus the idea of a hierarchical integration of subjective and intersubjective thought, as well.

An exploration of the nature of time, as well as its origin in space and motion, cannot take place in isolation from our ideas about the nature of the world, that is, a definite picture of the world (Weltanschauung). Here are the three common sense principles that probably can be said to underlie a normal, philosophically unreflective, view of reality:

1. We presuppose that the world exists, since we can experience it, think of it, speak of it, and act upon it.
2. We presuppose that the world exists independently of whether we experience it, think of it, speak of it, and act upon it.
3. We presuppose that the world is such as we experience it through perception and action, and, without contradiction, can think and speak of it.

These principles, equally, correspond roughly to the philosophical view of reality and our experience of it called realism, or, in this direct form, rather ‘naive realism’ or ‘objectivism’. Philosophical idealism, on the contrary, maintains that the world cannot exist independently of human thought and that reality rather is made up of it. Sensory experiences, according to Plato,
are real merely to the extent that they are determined by ideas or concepts. Such an idealistic understanding of knowledge at the same time presupposes absolute faith in human reason, reflected by philosophical rationalism (in a non-qualified sense) as opposed to philosophical empiricism, that is, the view that all human knowledge originates in sensory experiences.

1.2 Overcoming the static extremes of idealism vs. realism and rationalism vs. empiricism: from Kant to hierarchical-processual models of interaction

The history of philosophy bears witness to numerous attempts to understand human knowledge by modifying the two extreme oppositions idealism vs. realism and rationalism vs. empiricism, and in various ways – and to various extents – reconciling them with each other. For example, along with idea-driven a priori knowledge – mainly in the form of so-called analytical, that is logically necessary, judgements – Immanuel Kant (1982 [1787]: 48ff.) thus opens up a more realistic understanding of knowledge by considering also empirical knowledge of the world based on sensory experiences (a posteriori). By differentiating further sensory experiences into matter and form, he is able to take one more step away from the traditional metaphysical-idealistic position and, on this basis, maintain that a priori knowledge, viz., about the form of sensory experiences, also can be combined with empirical knowledge, that is about the matter of sensory experiences, in so-called synthetical, that is logically not necessary, judgements. If analytical a priori knowledge is based on certain logical rules (as, for example, that a matter of fact cannot be asserted to be both true and false; the law of contradiction), synthetical a priori knowledge is based on certain predetermined forms of perception (Anschauungsformen). Examples of such necessary forms, without which all experience and knowledge according to Kant is unthinkable, are space and time.

It will be demonstrated below that Kant’s a priori understanding of space and time can be abandoned. If we overlook here the fundamental perceptual-sensory and cognitive strategies of general nature at work (cf. Thelin 2002: 56, 60ff.; see 3.15, 3.16), we are in the case of space and time (as distinguished from cause-effect as a priori ‘category of reason’, along with, I would add, primordial attention to change-of-state as its origin; see 3.10) rather concerned with a primary kind of derived knowledge, which does not precede all experience, that is, is not innate, but is formed in the empirical process, and as such, from a given motoric-cognitive-linguistic stage of development in human ontogeny, generally conditions perception and cognition. Only in this system-immanent, hierarchical-processual sense of feedback-generated precondition, space and time might perhaps be regarded as
‘transcendental’ (for a critical discussion of Apel’s rather absolute conception of transcendentalism, see 1.7).

The above dynamic-constructive understanding of ‘transcendence’ would, if my interpretation is justified, correspond to Habermas’ (1987: 297) reference to “the a priori achievements [my emphasis] of the cognizing subject”. When he subsequently adds “[...] achievements for which there is no alternative: No experience shall be thought possible under different conditions”, it is an open question whether this is a claim for universal validity or a validity restricted to a socio-culturally defined community of agents – and corresponding phylogenetic dispositions, or an ontogenetically developed system of rules, respectively. The great probability of interdependence between the former and the latter indicates, in my view, that the traditional strict division of transcendental (a priori) knowledge and empirically achieved (a posteriori) knowledge has to be questioned and rather replaced by a coherent hierarchical-processual feedback model of knowledge. This assumption appears to follow naturally also from Habermas’ (ibid.: 303) clearly hierarchical-processual interpretation of Piaget’s ‘reflective abstraction’ as instrument for learning, as well as its result in the form of “schemata that underlie the knowing subject’s action” (cf. the notion of ‘conceptual schemes’ in Quine 1961 [1948]: 16ff.; 1961 [1953]: 44; Davidson 1984 [1974]; Putnam 1987b: 17; see further the discussion below, 1.15–1.16). It appears to harmonize in essence also with the philosophy of ‘experientialism’ or ‘embodied realism’ suggested from the standpoint of cognitive linguistics by Johnson and Lakoff (2002: 248) on the basis of an interactive understanding of experience, more specifically the conception of ‘embodied organism-environment interaction’ (very much in line with my biopragmatic position).

The important thing in this connection, however, is that Kant, besides the synthesis of various concepts which gave a name to synthetical judgements (for example, the earth revolves around its own axis), through his matter-form distinction (1982 [1787]: 65ff.) in effect postulates a superordinate synthesis, as well, viz., as a mediating link between all sensory experiences and their rational form. Thus he attempts not only to bridge the gap between concepts and the experienced world, but establishes (by way of his so-called ‘Copernican turn’; ibid.: 22) the experiencing subject, instead of the experienced world, as the origin of this synthesis, that is of the rationalization of sensory experiences (Kant’s ‘transcendental reflection’). By this Kant can be said to have laid the foundation for any subsequent exploration of human perception and cognition of the world that assumes a dynamical interaction between concepts (‘ideas’) and experience (applicable, basically, also to Hegel; see the discussion below, 1.5–1.8). It should, in addition, be kept in mind that since all experience essentially is gained subjectively, our knowledge about the world cannot be objective in an absolute sense, that is, identical with the world itself (Kant’s ‘das Ding an sich’). Objective, relatively objective, knowledge should therefore be understood as the result of
activities of interpretation by individual subjects, but in such general (non-solipsistic) forms which – primarily through their function of cognitive-linguistic description – grant this knowledge intersubjective validity. In other words, the world is real to us such as we interpret it and not as it is in itself (cf. also Nietzsche 1964 [1887]: 323, 331–348; Gadamer 1989 [1975]: passim).

Kant thus unites his modified, ‘critical’ idealism with a reconciling synthesis of modified (Humean) empiricism and non-absolute, ‘critical’ rationalism. Already his notion of ‘das Ding an sich’ (ibid.: 27 et passim) implies that Kant presupposes an underlying reality, but a reality that cannot express realism in a traditional sense, since he maintains also, as we know, that we cannot acquire knowledge of such a reality ‘an sich’ but only through the experiencing subject. When he removes focus from the experienced world to the experiencing subject and its perception and cognition, this is in fact an important step toward experiential as well as cognitive realism. In accord with Peircean pragmatism I understand the cognitive function in terms of semiotic-interpretative rationalization. This understanding allows me to regard this very step as the paradigmatic precondition for the present attempt at a novel cognitive-pragmatic orientation of epistemology within a biological-evolutionary framework (cf. Thelin 2002) and, more specifically, the revitalization of perspectivism (cf. Nietzsche 1964 [1887]; Ortega y Gasset 1961 [1923]: 91ff.; Popper 1966a: 261; Lukes 1982: 298–305; Thelin 1994: 263ff., 1999: 244ff.; Fay 1996: 72–91; Givón 2002a: XVI, 223, 225, 242–249, 261–299). The latter, in my view, is indispensable for our understanding of the procedure of selection in all human semiosis. Against this background one might with advantage reformulate Otto Liebmann’s (1865: 139) famous demand “Back to Kant!” as “Onward from Kant!” Such recognition does not necessarily imply any acceptance of Kant’s traditional-metaphysical, ‘foundational’ conception of philosophy as an “all-encompassing discipline which legitimates or grounds the others” (Rorty 1979: 6–9; see 1.17); nor does it imply the oblivion of pre-Kantian philosophical thought inasmuch as it has offered lasting contributions to our understanding of human knowledge (see below, especially my discussion of time and perspective in the light of the history of philosophy; 4.6.8).

Naturally, there is, as we shall see in the analysis of the concepts of space and time, still a considerable portion of idealistic thinking adhering to Kant’s transcendental philosophy (cf. also Peirce’s criticism; CP 1.39). However, we should not underestimate the reach of his novel thought, especially his rejection of rationalism in the absolute form it had in the idea-driven identification of the experienced world with the world itself by classical metaphysics. Now, the latter kind of identification can actually still today be found among outstanding representatives of the natural sciences, although then, of course, associated with the objectivist-realist conception of the absolute existence of the world. Thus Konrad Lorenz (1973: 9–32), for example, ap-
pears to maintain that man has more or less direct access to the world as it is, even though in a simplified form, viz., merely in those parts which are relevant for survival. For an equivalent, not entirely convincing, vindication of 'external realism’ and the correspondence theory of truth by Searle (1999: 4–37), see the detailed discussion below, 1.9. Without in the slightest detracting from the significance of Lorenz’s epochal ethological research (see Ch. 2), it is justified to be hesitant also about this 'partial’ kind of objectivist realism. How can we speak of 'partiality’ without knowing the entirety? Isn’t what is understood here as ‘partiality’ simply dictated by the typical human ‘perspective’ (as entirety), formed by the underlying biopragmatically determined perceptual-cognitive and linguistic capacities (along with an emotionally and socially conditioned system of values) ascribable to the human species?

It should be noted, in all fairness, that Lorenz – in his laudable endeavour to achieve scientific 'objectivity’ – actually demonstrates tangible ambivalence in regard to the concept of reality. First he (Lorenz 1941: 103–104) speaks of ”the absolute reality of the environment”, and then somewhat contradictorily says that ”nothing is absolute except that which hides in and behind the phenomena.” He (1973: 16ff., 19) also says, less ambiguously: "to everything that our 'knowledge apparatus’ tells us about the external reality corresponds something real.” This is, as far as I can see, in effect an expression of the correspondence theory of truth that questions Kant’s (and Popper’s; 1959: 453) position that ‘das Ding an sich’ is unknowable. Campbell (1974 [1970]: 445), consequently, points out that "to Lorenz more than Kant the Ding an sich is knowable […]”. Campbell then makes the conflicting addition: "[I]t certainly is only known in the knower’s categories, not in those of the Ding an sich itself.” From this Campbell draws the conclusion: "Thus he accepts Kant as psychologist if not as epistemologist.” This conclusion is not entirely convincing. First, why could Kant’s a priori categories (that is, to the extent that they can be defended at all), in principle, not be constitutive of epistemological theory? Second, on which grounds can the latter be said to exclude psychological conditions, viz., the subjective perspective as integrated part of the intersubjective cognitive-linguistic system? The latter option would be more in the spirit of George Mead’s (1937) pragmatically founded social-behaviourist psychology (see the detailed discussion below, 1.16). Campbell’s conclusion is contradicted also by Lorenz’s (1973: 17, 21) further explications, like ”we see […] a real picture [of reality], although one that has been simplified [my emphasis] in a harsh utilitarian way”; "clearly (anschaulich), though, we can experience only the simpler version [my emphasis] that the species-specific organisation of our sense organs and the nervous system 'allow us to experience’” (apropos the dimensions of space). These statements (cf. also Searle 1999: 4) should reasonably be interpreted as expressions of ‘partial’ objectivist realism. For a
critical discussion of the corresponding partiality concept in Schleiermacher, see Gadamer (1989 [1975]: 278ff.).

On the other hand, Lorenz (1973: 18, 25) appears to get close to Popper’s (1972: 105, 1974: 1059) ‘critical realism’ (within the framework of ‘critical rationalism’) when he espouses Campbell’s (1974 [1970]: 447) version of it under the name of ‘critical hypothetical realism’. The problem is that there still remains a significant incongruity between Lorenz’s more direct (even if ‘partial’) form of reality (and unqualified correspondence theory of truth) and Popper’s outspokenly indirect form of reality (and ‘correlative’ correspondence theory of truth). This incongruity, in my view, is essential though, since it can be regarded as the difference that prevents us from ascribing to the notion of ‘critical realism’ the crucial relationship between thought, language and action, on the one hand, and reality, on the other, which due to the complex integration of the two is of necessity one of ‘indirectness’ or, more properly (since this term, similar to ‘representationalism’, in essence is the result of an unconscious bipolar abstraction, dictated by correspondence theory, from this underlying integration), one of logical immanence. This relationship presupposes thus a structure based on hierarchy, process and developed mechanisms of feedback (Thelin 2002: 61; see further the discussion below, especially Ch. 3). From this understanding follows the idea of an integration of language in a holistic model, in harmony rather with Rorty’s (1979: 9) observation: “If we have a Wittgensteinian notion of language as tool rather than mirror, we will not look for necessary conditions of the possibility of linguistic representation.”

The interpretation suggested above, accordingly, is well in line with Hegel’s (1980 [1807]: 30, 33ff., 40ff.; 1985 [1832]: 37ff.) integrative understanding of the logical system – and in particular its processual nature. It rejects, however, the latter’s role as an absolute rational basis, identical with reality itself, and embraces rather (with Kant and Peirce) a regulative (cf. Apel 1980: 105, 117, 122, 125; Trevarthen 1990a, 1997; Thelin 2002: 5, 54ff.) understanding of the systematic rationalization of reality. The latter I conceive of as more adequate to the perspectival-hermeneutic view of knowledge advocated in the present work. The former absolute position cannot, however, be ascribed to Hegel unconditionally, viz., if one understands it as the exclusive, idealistic identification of reality with the world of concepts. By recognizing (like Kant) the existence of a reality independent of consciousness, but integrating it dialectically-processually with the world of concepts, Hegel in fact rather moves toward ‘critical realism’, even to a greater extent than Kant’s transcendental philosophy (which he criticizes; see 1.15). I do not exclude even the possibility of seeing, in agreement with Joachim Israel (1992: 35–36), in Hegel’s hierarchical-processual integration of reality and concept the very invalidation of the traditional epistemological opposition between idealism and realism itself. However, as a precondition for this constructive interpretation (against the background of the cognitive-
pragmatic model presented below not as surprising as might appear) I regard it as indispensable to remove the discrepancy, insuperable at first glance, between Hegel’s absolute understanding of the concept and the perspectival-hermeneutic view of knowledge defended here (for a possible solution, see the discussion below, 1.5–1.7, esp. 1.7).

1.3 Holism, coherence, and abduction: cognitive-linguistic processing vs. autonomous conceptualization

A basically processual (hierarchical-processual) understanding does not, in my view, exclude but rather presupposes an interplay of cognitive mechanisms on distinct levels, possibly correlated more closely to neural functions, as suggested, for example, by Sydney Lamb (1998) in his network model of language, based on the idea of ‘connectionism’. Such an interplay presupposes, however, structural commensurability or, at least, compatibility. In a corresponding way I do not see any essential difficulties in reconciling a general standpoint of holism (see below) with a coherentist view of the hierarchical-processual interrelations between such levels. Unless we espouse an absolute and infinite kind of holism, which appears to be untenable, there is no need for any exclusively ‘modular’ alternative to holistic coherentism, as suggested in Olsson (1997: 8). The latter conclusion, rejected also by Lakoff and Johnson (1999: 38), is founded on the static understanding of holism as represented by an ideal final state of (logical) consistency (as a precondition for epistemological justification), whereas a dynamic (dialectical) understanding of holism regards it as merely the guiding strategy for establishing such consistency (and justification) by the constant overcoming of contradictions within and between different hierarchical levels. Against this background it is no argument against holism that “sets of beliefs […] typically do not coincide with whole systems of beliefs” (Olsson 1997: 8), since this is the situation holism is meant to deal with whenever a broader ‘systematic’ justification of beliefs is called for by remaining inconsistencies in ‘sets of beliefs’ or, simply, by competing versions of them. However, where do ‘sets of beliefs’ end and ‘systems of beliefs’ start? Such a demarcation appears arbitrary in the light of a hierarchical-processual model of abduction by circular feedback (as suggested in 3.2). In order to warrant optimal processing, a model of this kind must, naturally, allow for some decisive short-cut mechanisms offering rapid access to the actual levels (cf. Thelin 1999: 254, 262ff.). We do not know in detail what these look like, but we may suspect that prototype theory (see, for example, Givón 2002: 38–40) cannot help us here as long as it applies only to ‘intra-level’ entities like categories or other clusters of cognitive features in terms of networks (with a corresponding centre-periphery
distinction), that is, without the necessary preconditions for hierarchical-processual coherence with other levels.

The latter restriction basically applies also to the prototype-inspired kind of autonomous ‘conceptualism’ suggested by Gärdenfors (2000) in terms of ‘conceptual spaces’. Although conceived of as an attempt to bridge the ‘connectionist level’ and the ‘symbolic level’, this theory lacks the corresponding methodological commensurability and thus does not warrant any functional coherence of the assumed ‘conceptual level’ with the two other levels. Symbolism, furthermore, is understood in a narrow way as referring merely to propositions or predicates of language (ibid.: 36–38, 43). This view of language, disregarding the immanent nature of its hierarchical-processual feedback to cognition, as well as perception and action, is evidenced by the author’s (p. 258) assumption that “a symbol just summarizes the information contained in a region of a domain of a conceptual space by referring to the prototypical element of the region.” It should be recognized, however, that Gärdenfors (pp. 35–40) on the basis of his well-founded criticism of symbolic representations in the classical form of Artificial Intelligence (see also below, 1.19) presupposes a hierarchical dependence between the levels of representation, as well as their dynamic interplay, in further developed models (pp. 37ff., 43–44, 260).

In reality, hierarchical-processual feedback requires a commensurability of linguistic, cognitive and perceptual-actional structure which is not offered by the theory of ‘conceptual spaces’. Such commensurability can, it appears, be achieved only by way of linguistically based cognitive decomposition and, I assume (see below), an abductive system of transformational rules. For such an overall decomposition, capable of accommodating, on the one hand, linguistic sound structure, morpho-syntactic structure and cognitive-semantic structure, and, on the other hand, their interplay with perceptual and actional structures, there is, as far as I know, only one adequate means of categorization at hand, viz., hierarchically ordered distinctive features. That these features should generally be founded in cognitive-linguistic analysis appears reasonable from the crucial role played by language in the cognitive ontogeny of man, but equally from the corresponding condition that the cognitive scientist’s access to thought structure of necessity goes through language. Naturally, cognitive scientists/linguists may abstract from language and postulate what they assume are pre-linguistic structures, or rather capacities.

That cognitive structure, according to Gärdenfors, should be assumed generally to take the form of a geometrical representation, supported, as it were, psychologically by its alleged advantage of economy in ‘concept learning’, is doubtful. This assumption is made possible by the isolation of a ‘conceptual level’ and the corresponding hypostatization of the notion of ‘concept’ as distinguished from the notion of ‘properties’ (ibid.: 59ff.), both defined topologically. According to the abductive-coherent model, based on
processually operated hierarchies of cognitive-linguistic distinctive features (compatible with perceptual-actional structure), there is, in the theory, no ground for singling out any 'conceptual level', nor, consequently, any notion of 'concept' – unless, of course, the latter is used as the conventional, static and always to some extent arbitrary, lexically dependent abstraction from underlying processually determined constellations of features. The notion of ‘symbol’ would, under the latter conditions, equally reveal its processual nature by applying to hierarchically different sign (sign-of-sign-of-sign...) functions. Just as there can be no isolated 'conceptual level', there can be no isolated 'symbolic level'.

The adequacy of distinctive feature theory should be assessed on the assumption that we perceive and cognize reality in a dialectical process of interpretation by construction. Such interpretation is realized in turn by the strategy of identification by constructive differentiation. Differentiation requires decomposition in terms of distinctive properties or features until the (constructive) identification of objects is accomplished. Distinctive features may accordingly be assumed to originate in phylogenetically inherited general perceptual-cognitive capacities and strategies (cf. Winograd and Flores 1986: 50ff.; see below, 1.19), represented mainly by: biological rhythmization resulting in divisibility and continuity, decomposition realized as partitioning (discontinuation), binarism and hierarchization, sensibility to change-of-state and cause-effect, memory and analogy. On this primordial basis of perceptual-cognitive dispositions, distinctive features – as a result of the child’s development of language – develop ontogenetically and grow successively in number and degree of cognitive-linguistic systematization and differentiation.

If this assumption is accepted as plausible, there can be no developed human cognition independent of language, as suggested by Gärdenfors’ autonomous conceptualism. Correspondingly, there can be no prevailing perceptual-cognitive system of exclusively geometrical-topological distinctions independent of language (a view contradicted also by Niels Bohr’s general standpoint; see 1.11, 3.12). Also in cases where such distinctions apparently play a decisive role (but not necessarily in prototype relations), as in perception and cognition of ordinary space, motion and time, shape, and possibly, colour, cognitive-linguistic distinctions may be assumed to interact significantly. Therefore, it is difficult to imagine that humans according to a general language-independent cognitive rule should "map different kinds of sense modalities onto spatial areas" (Gärdenfors 2000: 27), unless this is understood, of course, merely as the probably innate strategy of hierarchical ordering. But what Gärdenfors has in mind is a general and autonomous geometrical-topological theory of thought. This is the questionable idea, inspired by prototype theory, that he (pp. 1, 4ff., 44ff., 108ff., 123) attempts to underpin by advancing the notion of 'similarity' as the most crucial one in perceptual-cognitive analysis. Under these circumstances, ‘similarity’ be-
comes "a function of distance" (p. 110) and, more specifically, "the similarity of two objects can be defined via the distance between their representing points in the space" (p. 5). "Conceptual spaces", according to the author (ibidem), "provide us with a natural way of representing similarities", whereas 'similarity' "has turned out to be problematic for the symbolic and associationist approaches" (p. 1).

As far as 'symbolic approaches' are concerned, Gärdenfors' judgement here is, of course, dependent on his reference to the static-representationalist view of 'symbolism'. In a model based, on the contrary, on hierarchically ordered cognitive-linguistic features, commensurable with perceptual and actional structure, reality is interpreted by constructively singling out objects and assigning features to them which identify them by distinguishing them from other objects. According to this kind of immanent cognitive realism (as opposed to objectivism), the teleology in human perception and action is naturally served not by 'similarity' as the decisive cognitive means of objectification, but by identification. 'Similarity' is rather an implication of such objectification (see 5.1) and, thus, in Gärdenfors' interpretation, the result of a hypostatization of truly transitory stages of incomplete specification of distinctive features in ongoing processes of scanning and pattern matching, pursuing their goal of identification by differentiation. It is quite another matter that we probably have to assume a (system-immanent) mechanism of variable specification which, on (integrated) pragmatic-perspectival grounds, suspends further specification as soon as identification (and understanding) is achieved (see the discussion below). Here, however, no relation of 'similarity' is involved in any direct, teleological sense.

Under these circumstances the author's argumentation for "dimensional representations based on similarities in contrast to feature representations" (p. 111ff.) crumbles, also with respect to the advantages of economy for 'concept learning' he ascribes to the geometrical approach. There is, as far as I can see, no evidence whatsoever that points or regions in 'conceptual spaces', as representations of properties, can generally be said to be more easily computed than binary cognitive-linguistic distinctive features. But what is still graver, what precisely determines the location of points in 'conceptual space'? We are told that 'information', 'sense modalities' or 'perceptions' are 'mapped onto spatial areas'. By what means? Until this question is answered, we must suspect that such mapping has a hidden history, viz. that this kind of cognitive science tacitly suppresses language and runs the evident risk of vicious circularity. This suspicion is strengthened by the author's exclusive attention to induction (p. 203ff.) and his systematic treatment of context dependency (pp. 102ff., 113) – a traditional notion made superfluous by the immanent abductive-coherent model (or a corresponding operative-constructive treatment in terms of 'mental representations'; Givón 2002a: 223ff.).
Now, does this mean that spatiality has no significant place in perceptual and cognitive-linguistic structure? Certainly, not. As I will demonstrate below, strategies of perception appear on the contrary to exploit biological rhythmization for spatializing chaos in a preparatory sense, viz., by assigning to it, by way of screening, divisibility and continuity, thus creating preconditions for discontinuation (analysis) and differentiation as tools of individuation/objectification. This primordial kind of perceptual spatialization (likely to be reflected by the spatial dimension and the divisible continuity of the visual field as precondition for discontinuation and corresponding procedures of scanning and pattern matching in human situation analysis) may be assumed to be prelinguistic, and thus not restricted to human perception, whereas individuation/objectification, on this basis, by way of cognitive differentiation, in humans could not possibly take place without feedback effects of language (cf. Lieberman 1984: 331). This is why it appears impossible to accept any ‘symbol-independent’ cognitive representations even of objects of perception involving spatial distinctions such as, for example, shape. The simple reason is that space, naturally, cannot be perceived in itself, but only as partaking of language-dependent identification of objects. Kant’s idea that “we can quite well think it as empty of objects” (Kant 1982 [1787]: 68) is an illusory abstraction.

Therefore, spatial distinctions obviously should be understood as operating most naturally as integrated part of cognitive-linguistic analysis whenever space is involved. It is important, however, to be aware of possible differences in the hierarchical status of spatial distinctions – beyond the one demonstrated above as pertaining to primordial-preparatory spatialization of chaos. There is thus some evidence (see below) that spatial distinctions may be involved in some general way also in cognitive structure not associated semantically with space, and that this – for definite reasons – then takes place in the form of hierarchically secondary spatialization (and certainly involving language). If we proceed from the emotional foundation of cognitive development in the ontogeny of the child, it appears that basic oppositions assumed to be elaborated from the primordial good-or-bad-for-me distinction such as, for example, satisfied vs. hungry, warm vs. cold, dry vs. wet, absence vs. presence of pain, light vs. dark, sweet vs. bitter, etc., hardly can be imagined to be structured spatially in any deeper sense, as would appear to be the case in distinctions involved in the perception and cognition of the shape of things (as, for example, face recognition), of location and motion. If space now is applied to represent also the former kind of distinctions, we would naturally assume that we are concerned with some kind of secondary spatialization due to metaphor (analogy) on lower cognitive levels. The latter might actually, as we shall see, be the very condition for Gärdenfors’ generalized application of ‘conceptual spaces’, although without any corresponding hierarchical differentiation, and definitely without cognitive-linguistic coherence.
The analysis of the concept of time suggested below demonstrates that secondary spatialization apparently represents some kind of cognitive realism, and it does not appear far-fetched to look for one possible explanation of such a strategy in the phenomenon of ‘image schemas’ (cf. Lakoff 1987: 267ff., 281–83; Thelin 1991b: 276; Gärdenfors 2000: 2, 55, 158, 162ff.). The crucial question is: what cognitive status should be assigned to (spatially defined) ‘image-schemas’? If we leave aside the assumption of primordial perceptual spatialization (see above), and hold that there are central cognitive (cognitive-linguistic) distinctions which cannot possibly be said to be founded on (or structured in essence by) spatial distinctions, as reflected by oppositions like true vs. false, right vs. wrong, beautiful vs. ugly, friendly vs. hostile, happy vs. sad, rich vs. poor, etc., and still maintain that they may involve spatial distinctions, this can be explained in at least two ways: either spatiality is involved as one or more subordinate features in a complex hierarchy of otherwise space-neutral features, or it is involved in a general way by ‘image schemas’ comprising (embedding) spatially also originally non-spatial distinctions. The latter condition would be the case if we assumed, for example, that ‘image schemas’ function mainly as en bloc devices for overview organization and manipulation (by feedback), running parallel to (and cooperating with) incisive hierarchical-processual feature analysis, and thus offering an effective short-cut mechanism, adapted equally to memorization and retrieval of information. Such schemas (partaking, apparently, in definite ways, of situation analysis) could under these circumstances be understood thus to supply short-cut access to a proper hierarchical level of the dialectical process of analysis-synthesis, more specifically by connecting to some particular stage of cognitive-linguistic synthesis, and permanently accommodating itself (in predominantly spatial terms) to the latter's actual state. It might, accordingly, be the case that it is precisely in ‘image schemas’ that we have to look for the systematic ground for the conventional, static notion of ‘concept’, at least in the sense of ‘basic-level categories’ (with ‘body-based properties’; cf. Lakoff and Johnson 1999: 27ff.), as distinguished from abstract, ‘superordinate categories’.

In this hypothetical interaction of basically space-structured ‘image schemas’ and cognitive-linguistic analysis-synthesis, including space on a par with other categories, it would not be surprising if spatial features of the former were transferred by metaphor to essentially non-spatial content as a result of processual feedback. Such a procedure would apparently be reflected by expressions like high vs. low thoughts, broad vs. narrow interests, profound vs. superficial feelings, close vs. distant similarity, etc. We might, accordingly, characterize such metaphors as ‘superficial’ in comparison to metaphors taking place on hierarchically ‘deeper’ levels, viz., by proceeding here from the meta-cognitive (theoretical) ‘image schema’ of hierarchically ordered cognitive processes (cf., e.g., the hierarchical differentiation of metaphors in the reconstruction of the concept of time below).
The strategies of metonymy (see 3.8) and metaphor, when operating on deeper levels, are assumed, in this order, to pursue tasks of primary perceptual-cognitive (gestalt-based) selection and construction of distinct objects with analogical means of differentiation, respectively, whereas literary-tropological metonymy and metaphor normally operate on superficial levels where they apply to already established cognitive-semantic objects represented by lexical units. Tropes are easily recognizable as long as they preserve their creative novelty. However, the former, deeper kind, for example, of metaphor is never, or may never be recognized as such in the (literary) use of language. This applies, thus, to theoretically hypothesized metaphors such as those suggested in my perceptual-cognitive derivation of time (cf. Metaphors I and II; see 3.16), and, as it turns out, also to those ‘superficial’ metaphors that come into being only by changing knowledge of the world, like, for example, sunrise, the ends of the earth, body and soul.

Similarly, we obviously have to assume the existence of usually unrecognized metaphors of a secondary nature also in more abstract cognitive constructions, like the concept of time. The idea of ‘moving time’, so disastrous for traditional temporal logic (see 4.5), we thus frequently use unaware of its secondary metaphorical nature (cf. Metaphor III below, 3.16), though traceable on some reflection. It is symptomatic that Gärdenfors (2000: 6ff.), when he refers to the concept of time, unconsciously does so by proceeding from the implications of this very metaphor (recognized already by Kant; 1982 [1787]: 77, 82), viz., by way of the traditional, geometrically structured (linear, divisible and unidirectional) dimension of time, in isolation not only from the perception-cognition of space and motion by observers, but also from the central functions of perspective inherent in their cognitive-linguistic procedures of selection. Against this background it should be no surprise that it is only by an analysis of time, proceeding from and integrating linguistic temporal structures (primarily, the aspect category), that we finally are in a position to trace the true spatial (spatial-perspectival) origin of time.

Since Gärdenfors’ theory of ‘conceptual spaces’ thus appears inadequate to penetrating the most central human concept derived from the perception and cognition of space (motion of things in space), that is time, it remains uncertain to what degree general applicability can be ascribed to his analysis of spatiality in cognitive distinctions, whether they originate in space or not. It is to be hoped, however, that his findings will throw light, more specifically, on the essence of ‘image schemas’, in the general spatiality of which his theory appears to have its tacit origin.

It should be noted that Gärdenfors (pp. 44, 104, 119) pays some attention to conditions of subjectivity in perception, and even the corresponding role of perspective. His observations are not elaborated in any systematic way, however. Rather than integrating subjectivity and perspective into the process of perceptual-cognitive selection, he refers them to his ad hoc conception of context (unknown to the coherentist model) as the factor which is
understood to influence the *salience* of domains and their corresponding *weighting*. One cannot really blame Gärdenfors for not discerning the perspectival nature of time. His exclusively tense-based understanding of time has been the tradition all along from Aristotle to modern temporal logic. That decisive insights into the perspectival nature of time, as well as its spatial origin, have emerged in the last decades from linguistic (cognitive-linguistic) studies of the temporal category of *aspect* (traditionally, ‘verbal aspect’), must have been unfamiliar to him. But this is not the point. The point is that the theory of ‘conceptual spaces’ from the very start, by isolating in essence its cognitive analysis from linguistic data, as a consequence deprived itself of the preconditions for a proper understanding of precisely the spatial origin of temporal distinctions. My conclusion, more generally, is that if he had taken linguistics into account, Gärdenfors would have been in a much better position to contribute significantly to cognitive science in general, and to the further exploration of ‘image schemas’ and their cognitive status, in particular.

A biologically founded philosophy, which assumes the role of a superordinate synthesis, thus sees momentous restrictions in the kind of autonomous ‘conceptualism’ expressed by Gärdenfors’ geometrical understanding of spatiality in human thought. Its deliberate dissociation from the symbols of language misses the organic interplay between cognitive and linguistic activities. The spatiality of thought, as recognized already by Maurice Merleau-Ponty (1962: 100, 152), does not originate in geometry, but in our biological bodilyness and need to orientate ourselves and act/move in relation to other bodies (cf. MacWhinney 2002: 240ff). Space under these conditions stands out rather as a mental construction for perception and action, reflected by language. Merely in a relationship of interaction it appears possible, conversely, to explain the role of language for how we perceive, conceive, and act upon reality.

1.4 ‘Critical’ (internal) vs. ‘direct’ (external) realism

Returning now to my above (1.2) interpretation of ‘critical’ realism, I would like to remind the reader that in order to make it possible to cope with reality there takes place, according to this interpretation, an objectification of it by means of exploring abstractions of its *appearance* in a complex relationship of integrative dependence. The putative objectivity of reality is thus essentially the outcome of a tacit metaphor of the more or less successful role played by these abstractions in our attempts to act upon this reality, whatever it looks like. Habermas (1987: 303) in a corresponding way sees a parallelism between Piaget’s learning mechanism of ‘reflective abstraction’ and Kant’s transcendental reflection, but also Hegel’s ”power of negation which dialectically supersedes self-contradictory forms of consciousness” (see fur-
ther my discussion below of Hegel’s dialectics). Rationalization through exploring abstractions of necessity takes place as tentative, intersubjectively testable (cf. Popper 1959: 44), constructive interpretations or hypotheses. Consequently, it is rather to the latter that we more properly are entitled to assign objectivity, but in a relative sense, that is depending on the degree of their purposefulness ("reason is purposeful action"; Hegel 1980 [1807]: 20). On this basis, also the notion of realism (in accord with Kant) is dislocated from the abstracted 'external' reality to its observers, that is to their ways of thinking of, speaking of, and acting upon this reality (cf. Thelin 1999: 298ff.). This is a kind of realism that, in contrast to Campbell’s (1974 [1970]: 447-51) opinion, would harmonize well with the principles of pragmatism, but also with Popper’s (1972: 159) conception of his 'third world': "it is possible to accept the reality [...] of the third world, and at the same time to admit that the third world originates as a product of human activity.” Popper’s ‘autonomous’ understanding of the ‘third world’, however, is questioned below (1.10).

One fundamental reason for the ambivalence observed with Lorenz, and to some extent with Campbell (but less likely with Popper), in my view, is the disregard of the crucial distinction between the existence of reality as such, on the one hand, and its *ways of being*, on the other. "Saying things is not always saying how things are” (Rorty 1979: 371; cf. Sellars 1963: 1; Habermas 1987: 305). This distinction can be said to be implied in Hegel (1980 [1807]: 433) by the successive development of knowledge from immediate perception to the formation of essential, 'true' knowledge in the form of concepts and their 'absolute' union with reality. It can, at least in part, be understood to be reflected also by Charles S. Peirce’s attempt to distinguish between 'existence' and 'reality' (see below, 4.6.3: Excursus II, my interpretation of the relation between the two as one of hierarchical interdependence). In the opposite case (of disregard) there is thus a tacit presupposition that recognizing the former ('knowing that') implies that we also have more or less direct access to the latter ('knowing how'). This position is expressed by Lorenz’s idea of 'partial' knowledge (referred to by me above) and Searle’s (1999: 1–37, 39ff.; see the detailed discussion below, 1.9) defence of 'external' realism. In an equivalent way Campbell (1974 [1970]: 447) says that "our current views of reality are partial and imperfect.” Popper (1974: 1059ff.), to be sure, speaks of "a world which is to some extent 'knowable' or 'explorable’", but his inverted commas and his synonymous use of 'explorable' makes a partially-direct understanding in his case less likely. It is, in my opinion, also contradicted by the entire spirit of fallibilistic epistemology that he (pp. 1060, 1062) shares with Peirce: "all human knowledge is fallible and conjectural”; "nothing is 'given’ to us by our sense; everything is interpreted, decoded: everything is the result of active experiments, under the control of an exploratory drive.” Popper’s position, to my mind, is clarified by the distinction he (1972: 104–105) makes between
‘common sense realism’, on the one hand, and a ‘common sense theory of knowledge’, on the other. Popper thus accepts the former, but rejects the latter. That this realism cannot be a direct one can be concluded also from Popper’s (1966a: 261) basically perspectival view of reality. This kind of ‘critical’ realism is, as we shall see, reconcilable with, if not dependent on, a biologically founded pragmatism of the kind proposed below. In Peirce’s spirit and in agreement with my corresponding suggestions, this philosophical view of reality could perhaps more adequately be termed abductive realism, that is, if it is meaningful to maintain the philosophical realism concept at all (see the discussion below, 1.5, 1.8, 3.1–2, 3.7, 3.13, 3.16).

Peirce’s conception of reality was not entirely transparent and changed over time. It is obvious though that his semiotic project provided his basic idealism not only with a dimension of objectivity, which implied a revitalization of Schelling’s and Hegel’s objective idealism as well as criticism of Kant’s transcendentalism, but also – through the interaction with external reality established by his ‘pragmatic maxim’ – with a dimension of realism. This certainly was no objectivist realism or metaphysical realism (although Putnam saw signs of the latter; see 4.7), but rather – in accord with Apel’s (1980: 103) designation of it as ‘sense-critical realism’ – a realism founded on the interaction between mind and (actional) world, that is, in the latter’s rationalization. Nor does Peirce’s ‘historical’ understanding of truth as “the opinion ultimately agreed to” (which is problematic, of course, not only by its indeterminateness/untestability but also by its final absoluteness irreconcilable with perspectivism; see the detailed discussion below, 4.7) justify any suspicions of ‘external realism’ of some kind, because Peirce’s understanding is based on intersubjectivity rather than (external) objectivity, and a corresponding outspoken conventionalism. Peirce (CP 5.257) says that "ignorance and error can only be conceived as correlative to a real knowledge and truth", but their reality is doubtless understood to be cognitive or ‘internal’, because he contrasts with it ‘external’ reality: “over against any cognition, there is an unknown but knowable reality.” Now we understand – and this is important – that Peirce’s ‘knowability’ is synonymous with ‘cognizability’ (entirely in line with my above interpretation of Popper’s position), viz., as an expression not of any form of ‘direct’ realism, but of the interaction between the ‘internal’ world (subject) and the ‘external’ world (object). The latter’s existence is thus defined (ibidem) by its ‘cognizability’: "cognizability […] and being are not merely metaphysically the same, but are synonymous terms.” This definition allows us to presuppose the existence of an (external) world to the extent that it can be comprehended by our cognition (and perception), but does not make any statements about its properties in any absolute sense (cf. above my reference to Peirce’s corresponding attempt to distinguish between ‘existence’ and ‘reality’; see further the discussion below, 4.6.3: Excursus II). These conditions could, according to my interpretation, be satisfied in essence by the model of ab-
ductive realism inspired by Peirce and presented in outline below (see esp. 3.2).

Even if the strategy of selectively perceiving and cognizing reality (cf. Givón 2002: 225ff.) is obvious, it presupposes, in my view, a dynamic interdependence between reality and concepts, on the one hand, and between experienced reality, object, and experiencing subject, on the other. Along with analytical a priori knowledge, which may be assumed to be innate, Kant thus offers an opening for the formation of concepts on an empirical basis. But since it is justified to question Kant’s a priori interpretation of synthetic knowledge, for example, in such fundamental categories as space and time, the most important philosophical insight we can acquire from his novel thought appears to be the idea of synthesis of concepts itself (a priori or a posteriori). This idea in turn prepares the way for the processual understanding of the perception and cognition of reality represented by Hegel (see below, 1.5ff.) and, in developed form, by hierarchical-processual feedback models of recent years (cf. Thelin 2002).

Peirce (cf. Ketner 1992: 60), as we know, also objected to Kant’s transcendental ad hoc treatment of the concept of time, which in Peirce’s view had an ‘evolutionary’ [I would rather say, ‘processual’] origin and represented something ‘real’ (CP 6.96). At the same time as Peirce (CP 1.384) basically accepts Kant’s idea of synthesis, he subjects it to an incisive revision with regard to its relation of order vis-à-vis analysis. His criticism is based on his understanding that analysis (of what “in itself has no parts”, i.e., continuity) always precedes synthesis, and not the other way around as maintained by Kant (cf. Rorty 1979: 152ff.; see the detailed discussion below, 4.7). If we assume that Kant’s transcendental solution of the problems of space and time primarily had ideological (scientific-ideological) motives (see 4.6.8), we are in a position to appreciate more adequately many of his pertinent, but often overlooked, observations of these categories in unambiguously pragmatic-constructive terms (cf. Melnick 1989; see 4.6.8).

1.5 Hegel’s ‘dialectical movement’ as precursor of cognitive processing and its potential invalidation of the idealism-realism controversy

It is most interesting that Hegel’s (1980 [1807]; 1985 [1832]) dialectical epistemology in striking ways not only anticipates the modern (or perhaps, rather postmodern) view of knowledge and thought as process (cf. also Israel 1990: 17; 1992: 31, 33), to the extent even of including feedback mechanisms (1980 [1807]: 423, 429). Also, his conception of the cognitive content being determined by the ‘dialectical movement’ (1980 [1807]: 45;1985 [1832]: 38) of stepwise negation, of necessity implying also the positive, and
vice versa (1980 [1897]: 34–35, 38, 42, 431ff.), can indeed be interpreted as expressing the view of this 'movement' as a mediating process of selection (parallel to Gadamer's 'dialectic of question and answer'; 1989 [1975]: 369ff., 471) between hierarchically ordered binary oppositions (in accord with a dynamic interpretation of Roman Jakobson's theory of distinctive features; Thelin 1999: 262ff.; 2002: 61). It is noteworthy that Hegel (1980 [1807]: 429) thus presupposes that this process is characterized by what nowadays is called 'circular feedback' (cf.: "Sie [die Bewegung] ist der in sich zurückkehrende Kreis, der seinen Anfang voraussetzt, und ihn nur im Ende erreicht" ('It [the movement] is a circle, recursive in itself, that presupposes its beginning, and achieves it only in the end').

Hegel (1980 [1807]: 27, 33, 433) also demonstrates in various ways his insight into the hierarchical structure of the cognitive system, among other things, by making the distinction between surface structure and deep structure (cf. 'Oberfläche' vs. 'Tiefe'). Noteworthy is also the actional or pragmatic view of cognition repeatedly expressed by him (1980 [1807]: 20, 48, 424, 430ff.; cf. also Israel 1990: 22). Another sign of his early cognitive-pragmatic understanding, reconcilable with recent attempts to correlate cognitive and neurobiological processes, are his (1980 [1807]: 40ff.; 1985 [1832]: 38) explicit references to the rhythm of the 'dialectical movement' (cf. Thelin 2002: 12, 29, 36ff., 54, 62; Givón 2002: 41). Hegel's (1980 [1807]: esp. 37) criticism of Kant's transcendent philosophy (see also Habermas 1987: 289; Israel 1992: 24–36) for being formalistic and superficial can be applied directly to the possibility of abandoning (according to my suggestion) Kant's a priori interpretation of the concepts of space and time, in favour of their reconstruction rather within the ontogenetic cognitive-pragmatic system. Hegel's (1980 [1807]: 30, 40ff.; 1985 [1832]: 37ff.) understanding of the cognitive 'dialectical movement' as an essential part of logic and identical with "the rationality and rhythm of the organic whole" makes it reconcilable not only with the biopragmatically founded cognitive-linguistic approach to knowledge attempted here, but also with the kind of non-formal logic found in Zinkernagel's and Israel's attempts to modify philosophy of language (see the detailed discussion below, 1.11).

Let us return now to the postponed question whether Hegel's model can indeed be said to represent a new kind of epistemology in the light of which the traditional distinction between idealism and realism would be superfluous. Certain circumstances, as we have seen, do speak in favour of such a view. The usual opinion (cf., e.g., Searle 1999: 16, 18) that Hegel's absolute understanding of the concept and its union with reality (in the form of 'ideas') is still an expression of pure idealism, that is, the fundamental view that concepts determine or even make up reality, obviously overlooks some important conditions. The fact that Hegel (like Kant) recognizes the existence of a reality independent of consciousness is not of course a condition that alone qualifies as proof of a realist, or rather non-idealist, position. The
decisive condition is that the external 'object reality' in Hegel is integrated by the internal 'subject reality' created in processes of consciousness which, according to Hegel (1980 [1807]: 34, 422, 431ff., 433), are the 'true' and 'essential' reality. This new, cognitive reality (cf. Thelin 1999: 299; 2002: 61), according to my interpretation, is created thus in a successive hierarchical process of 'two-dimensional' dialectical movement (or interaction; see the further discussion), on the one hand between subject and object in some kind of constructive identification by pattern-matching in order to achieve the likeness (Hegel's Gleichheit; 1980 [1807]: 18, 29ff., 33, 42; see the reference to Husserl's 'syntheses of identification' in 1.11) of the two; on the other hand, within the subject/consciousness where unlikeness (Ungleichheit) in this pattern matching process is overcome continuously by the abolition of oppositions through negation, that is, negative choices, up to the final, positive choice and the resulting cognitive whole in the form of an (according to Hegel; see below, 1.7) 'absolute' concept that matches (is realized in) external reality.

This composite process of successive analysis-synthesis is more complex than hitherto indicated because it presupposes in addition the reconciliation of negative and positive choices on different levels by way of hierarchical embedding, thus forming the cognitive whole. The final positive choice, which precludes the actualization of further distinctions otherwise possible, can thus be preceded by both negative and positive choices, although Hegel (in his 'simplified' treatment of the dialectical movement) emphasizes precisely negation.

The above suggestion that further distinctions are generally possible but may be left unspecified is a consequence of the assumption that the perspectival basis of knowledge does not presuppose any absolute matching or identification. This relativity of knowledge, founded already in the restrictedly human perception of the world, is thus dictated more specifically by the perspective of individual human subjects (cf. Thelin 1990a: 19). Due to the subjective perspective, intersubjective, that is, linguistically supported, cognitive distinctions at (processually) lower levels may not be specified, though, without threatening understanding (relative understanding) given that identification at higher levels is already warranted. This kind of cognitive deficiency-redundancy relationship (reflected in a way by prototype theory; cf. Givón 2002: 38–40) corresponds neatly to the formal-linguistic one and has a pronouncedly pragmatic dimension. Subjective cognitive distinctions, as the dynamic basis of the subjective perspective, may remain subjective or advance to intersubjective status by linguistic implementation. The latter possibility is a precondition for the interaction of subjective and intersubjective ('objective') knowledge (in line, essentially, with the Cartesian and Humean view). Only when linguistic implementation is successful and cognitive intersubjectivity is established, is understanding (relative understanding) possible. It is interesting that the principle of incomplete cogni-
tive specification (related, indirectly, to functions of both 'similarity' and 'partiality' in metaphor and metonymy, respectively; see below, 3.8) has an equivalence in Foucault’s (1987: 105) observations of historical-political decomposition, viz., as an "operation [leading] to an increasing polymorphism" characterized by "progressive, necessarily incomplete saturation". There is, of course, another more direct parallel in Lyotard’s (1987: 89) reference to the "heteromorphous nature of language games" associated with the concept of perspective (ibid.: 84).

It would in a discussion of Hegel’s dialectic be misleading to draw a parallel between the background just sketched and the model of thesis-antithesis-synthesis (even though all three ingredients appear to be present here). This model, advocated by Schelling but rejected by Hegel, is clearly problematic, at least in its mechanical application as a model of development determined by absolute (natural) necessity. One has to ask the question: where does synthesis come into play? I would suggest that synthesis does not 'come into play' anywhere but rather is present all the time as the constant superordinate realization of the successive, repeated movement of analysis through selection between binary oppositions at various levels. We would not, however, fully understand the dynamic essence of synthesis unless we assumed that this movement of analysis is dialectical (recursive, repetitive) not only within this 'internal' cognitive system (the subject), but also in relation to the 'external' reality (the object). The apparent dualism expressed by the distinction 'internal' vs. 'external' is in fact abolished by the interaction implied by the dialectical movement, in favour rather of a dominating condition of hierarchical-recursive immanence. Besides the subject-based movement we have to reckon with the parallel movement (interaction) between subject and object. This 'two-dimensional' dialectical model of thought and knowledge would not function without recording and analyzing changes in 'external' reality. The most natural instrument for these activities is a permanent feedback between subject and object, but – as a necessary consequence of change – also within the subject, that is between those levels of cognitive determination involved in the analysis of change.

1.6 Hierarchy, process, and subject-object interaction in Hegel’s dialectic, and the pivotal role of circular feedback in Gadamer’s philosophy of hermeneutics

The permanent movement to and fro between subject and object, as well as within the subject, may be assumed to have the shape of a circle, which is a complex ('two-dimensional') circle, or rather two communicating circles. This assumption brings us to equivalent lines of thought in hermeneutic (primarily literary-hermeneutic) philosophy, viz., the idea of a hermeneutic
circular movement between interpreter (subject) and text (object). This idea has, with its origin in Schleiermacher, Dilthey and Heidegger, been elaborated most clearly by Hans-Georg Gadamer (for an independent development of a circular-interpretative view of sensorimotor coordination, see Dewey 1972 [1896] and below, 3.3). It is essential to the concept of hermeneutic circle that it came into being as an expression of the dynamic relation between the whole and its parts. Depending upon how one applied the concept, somewhat different content was read into the whole and the parts, respectively. However, Gadamer (1989 [1975]: XXXV, 175) most pertinently summarized the essence of hermeneutics – and its corresponding relevance to epistemology – when he described it as "a circular relation between the whole and its parts" and added (p. 190) that "fundamentally, understanding is always a movement in this kind of circle, which is why the repeated return from the whole to the parts, and vice versa, is essential. Moreover, this circle is constantly expanding, since the concept of the whole is relative." Justification of this view Gadamer, like me, finds precisely in Hegel's 'dialectical movement'. Therefore one should, like Hegel, abandon the thesis-antithesis-synthesis model (with its superficial hierarchy and processuality, as well as lack of a feedback mechanism and explicit subject-object interaction) and attempt to incorporate instead the hermeneutic circle as feedback mechanism in a hierarchical-processual model, possibly of the cognitive-pragmatic kind suggested here. Its fundamental characteristic can then be understood rather as an analysis-synthesis process, based on binary distinctions, where the actual synthesis – the whole – in the subject constantly changes (cf. Rorty’s "new, synthetic vocabularies"; Rorty 1987 [1982]: 59) as a consequence of its feedback with the changing parts (and the given perspective) in the actual analysis of the object/reality by the subject. This interpretation (application) of Hegel’s dialectical processuality appears thus to have points in common with Rorty’s constructive appreciation of it as "temporalization of rationality", more specifically as "the single most important step in arriving at the pragmatist’s distrust of philosophy" (for a critical discussion of Rorty’s denunciation of ‘capitalized Philosophy’, see 1.17).

The view taken here of the mind-world interaction, based on the subject’s perspective, is thus in line with Gadamer’s (1989 [1975]: 266–285, 360ff., 461, 556) philosophy of hermeneutics. His position was formulated most pertinently by Kenneth Baynes (1987: 320): "According to Gadamer, understanding is an event […] in which both interpreter and text (or text analogue), 'subject' and 'object', mutually determine one another." Proceeding from Gadamer’s (op.cit.: 270) fundamental insight that "the recognition that all understanding inevitably involves some prejudice gives the hermeneutical problem its real thrust", Baynes (ibidem) summarizes the impact of Gadamer’s hermeneutics on epistemology (and perspectivism, I would add) as follows: "Gadamer’s […] claim […] is that prejudices belong to the very possibility of understanding and hence that the Enlightenment ideal of objec-
tive knowledge – knowledge freed from all particular perspectives – is an illusion.”

1.7 Hegel’s conceptual absolutism as a reflection of cognitive-linguistic universality, and the new absolutism of Apel’s transcendental pragmatics of language

The question remains whether there can be a reconciliation of the apparently conflicting ideas underlying Hegel’s absolute understanding of knowledge, on the one hand, and the perspectival-hermeneutic model suggested here, on the other. One possibility is that it is rather a matter of different hierarchy and degree of cognitive complexity. It would thus appear possible that the 'absolute' (or 'essential') nature ascribed to concepts by Hegel corresponds, at least in part (see below), to the universal nature one might ascribe to the smallest components of thought in the shape of distinctive (binary) features, rather than to the concepts themselves. These universal distinctive features, which are thus more fundamental than the entities we conventionally refer to as concepts and make up the latter, may be assumed to be 'absolute' only in the sense that they are a cognitively-linguistically based prerequisite for all intersubjective understanding and communication, as distinguished from structures of a 'relative' nature, that is on such levels of consciousness that express subjective perspectives and interpretations. To the extent that they can be communicated at all, 'relative' (language-specific, idiosyncratic) distinctions may also be assumed to be based on 'absolute' (universal) distinctions and are likely to be characterized by combinations of the latter on such levels and in such ways that they, for example as visual images or linguistic propositions, reflect individual points of view. I do not exclude thus that already the conventional level of concepts can be a carrier of communicable individual interpretations. 'Absolute', or rather intersubjectively valid, cognitive distinctions may be assumed to possess a high degree of constancy, founded as they are, on the one hand, on innate (universal) cognitive capacities, and, on the other, on the linguistic realization of the latter as well as of conventionally determined patterns for experiencing reality. Cognitive distinctions in the latter case can obviously more easily be subject to changes, at least in usage, as a consequence of changes (in the view) of reality.

The relativizing, intersubjective interpretation of cognitive 'absoluteness' suggested above at first glance appears to harmonize with Karl-Otto Apel’s (1980: 93-135; 1987) conception of 'transcendental pragmatics of language' and its corresponding framework of an 'ideal communicative community'. However, there are substantial differences. With his point of departure in Peirce’s pragmatic semiotics (which is also mine), Apel attempts to give pragmatics a solid foundation in the form of intersubjective knowledge that
he defines as ‘indubitable evidence’. In this way he also wants (as distinguished from Quine) to argue for the recognition of ‘philosophical foundations’. The natural target of his criticism therefore becomes Peirce’s principle of fallibilism and, more specifically, its allegedly absolute nature in Popper’s ‘critical rationalism’. Apel (1987: 280) does not deny the role of doubt or criticism as such, but maintains that these presuppose transcendental conditions (‘final or indubitable evidence’), mainly in the shape of a ‘minimal logic’, the existence of a real world, and pragmatic rules for ideal communication. Here Apel, in my view, underestimates the consequences to be drawn for this issue from Peirce’s dynamic-evolutionary understanding of knowledge (and truth, that is, as the result of consensus in the community of inquirers ‘in the long run’). I do thus not see any reason for recognizing any paradigmatic opposition between the principle of fallibilism and the necessary norm that has to underlie any identification of errors. The decisive question is what this norm looks like. Peirce’s (and Popper’s) dynamic, hypothetical-interpretative understanding of the norm does not allow of its absolute, unchangeable status. (I overlook here the problematic final absoluteness in Peirce’s historical conception of truth as ”the opinion to be ultimately agreed to”; see the discussion in 3.7.) ‘Transcendental’ knowledge in the form of ‘indubitable evidence’ can therefore be understood merely as norms related to a given stage of the knowledge process. Apel (ibid.: 260ff.) is right, I believe, in his criticism of Popper’s inability to integrate in a coherent way the interpretative function of the subject in a pragmatic model of cognitive-linguistic intersubjectivity. This inability is evidenced, for example, in Popper’s anti-psychologism (see also my criticism of his ‘three worlds’ below, 1.10). It would not be fair, however, to ascribe implicitly to Popper (as distinguished from Peirce; cf. Apel ibid.: 265) the trivial mistake of asserting the possibility of doubting everything at once.

Apel’s problem is that he is captive to a static-hierarchical view that prevents him from incorporating in a deeper sense into his pragmatics the immanent dynamics of Peirce’s interpretant and, more specifically, of Heidegger-Gadamer’s hermeneutic circle (see 1.8). According to the understanding of knowledge as a hierarchical process with circular feedback mechanisms, there is formed, in the course of human cognitive-linguistic ontogeny (on the obvious basis of determinate genetic dispositions), a system of norms or rules for the rationalization of our experiences. The latter may be of a more or less valid/constant kind. As difficult as it is to draw a rigid borderline between phylogenetic dispositions, on the one hand, and ontogenetic cognitive capacities and strategies based upon them, on the other, it is equally difficult to draw a rigid borderline between rules that are of such a degree of validity/constancy that they might be considered ‘transcendental’ (in Apel’s absolute sense), and those which are not. It would simply be a matter of successive hierarchical coherence. Not even formal-logical rules (Apel’s ‘minimal logic’), which presumably are just abstrac-
tions of a biopragmatically founded cognitive-linguistic logic, can therefore, in my view (for which there is support in Quine; 1961 [1953]: 43), be excepted generally from empirical changes (even if the probability is restricted). In the hermeneutic circle they are not only invoked but also questioned constantly (even though unconsciously, in part) whenever our interpretations of reality are contradictory, for example, due to the latter’s non-transparent complexity. However, experience tells us not to change over hastily a general norm, like a formal-logical rule, but rather to undertake another circular movement to test the correctness of our choices (uses of the rules) at previous cognitive-pragmatic levels, of a lower degree of intersubjective validity and, possibly, to some extent characterized by an idiosyncratic perspective.

By incorporating in this way the principle of the hermeneutic circle (circular feedback mechanisms; for pertinent observations, see also Vollmer 1987) into a hierarchical-processual model of knowledge, we are now in a position to reconcile the principle of fallibilism (‘virtually universal doubt’) with its preconditions, observed with insight by Apel, in the form of pragmatic evidence, not as absolute (‘transcendental’, ‘final’ or ‘indubitable’) rules, but as experientially derived (and thus basically changeable) intersubjective norms for the rational objectification of reality. As one possible way of integrating Peirce’s and Popper’s fallibilism, as well as their ideas of a permanent process of hypothetical exploration, into a functioning system, I present below in the form of a working hypothesis (very much in Peirce’s spirit) a pronouncedly abductive overall model of the logical procedures underlying the semiosis of perception and mental/physical action (see 3.2). In the light of this model, based on the idea of a fruitful pragmatic-semiotic circle, as distinguished from a vicious, logical circle (a distinction Apel himself once had made, but apparently without drawing the necessary consequences from for his transcendental-pragmatic theory; cf. Apel 1980: 108), a corresponding problem arises from Apel’s ambition to discern, with reference to a particular phase of the knowledge process, what could serve as the ‘foundations of philosophy’. This idea would not be meaningful for those who (with Hegel) understand this process rather as a recursive dialectical movement. Apel’s (1987: 272) attempt to separate rigidly philosophical argumentation, as a transcendental language game, from all other argumentation, as ”empirically describable language games” (ibid.: 281), contradicts this conception of constant interaction. Hierarchization within the hermeneutic circle – as the foundation of all understanding – can only be processual and relative, that is, related to a specific movement in a specific phase of it.
1.8 The growing inadequacy of the idealism-realism opposition, and traditional metaphysics in the light of Hegel’s anticipation of abductive epistemology

Hegel’s hierarchical-processual view of the development of consciousness from the immediate perception of the subject to the ‘absolute’ concept, against the background sketched above, stands out as a very advanced attempt to approach the problem once formulated as follows: “The great challenge […] facing cognitive-pragmatic science […] is the task of integrating a theory of perspective […] into functional semantics and a corresponding theory of knowledge” (Thelin 1999: 303). As the reader will realize, such a theory presupposes not only hierarchy and process but also developed feedback mechanisms (cf. Thelin 2002: 10ff., 59) that enable a constant circular movement (cf. Heidegger’s hermeneutic circle and Gadamer’s discussion of it; Gadamer 1989 [1975]: 266ff.) between the smallest and biggest building bricks of thought and language; between the individual perspective (and interpretation) and its intersubjective means of expression; between the immediate, subjective perception of reality and its structuring in rational and communicable forms. Even such feedback mechanisms (suggested, actually, by Popper, as well, in his evolutionary theory of error elimination; Popper 1966b: 25) were, as demonstrated above, foreseen in a way by Hegel in his progressive understanding of human thought and knowledge. I am inclined to support Israel’s (1992: 36) opinion that Hegel already in effect made the distinction idealism vs. realism more or less irrelevant.

It is not self-evident that the concept of metaphysics becomes superfluous on the same premises. It is questionable, however, whether metaphysics in an absolute sense, idealistic or realistic, can be said ever to have been a serious option. The total rejection or, conversely, hypostatization of experience appears to be an ideologically motivated suppression by abstraction of all sensory experience, or reason, respectively. It would probably be appropriate to consider rather the history of philosophy to demonstrate changing positions between these two extremes. Hegel’s metaphysics (like Kant’s) is surely a revised form of classical metaphysics, but the question is whether the concept today still fulfils a meaningful function at all. My reinterpretation above of the ‘absolute’ basis of reason that reconciles in an abductive-coherent model reason (‘theory’) and experience thus rather makes ‘metaphysical’ synonymous with ‘theoretical’ (or ‘speculative’ in a relative-hypothetical sense). The position of ontology as the foundation of philosophy, against this background, can apparently be modified and its issues (on the basis of a determinate model of the world; cf. the corresponding discussion of ‘conceptual schemes’ in Quine 1961 [1948]: 16ff.) handled, more specifically, by including in the hierarchical-processual (dialectical) model such fundamental cognitive content as, let us say, the distinctions +/- PHA-
SALITY (i.e., activity vs. state/property) and +/- CHANGE-OF-STATE (see below, 3.13), on the one hand, and functions of predication or identification of things by means of distinctive properties (or other things), on the other. As a consequence of this reasoning, various attempts to summarize in one single formula the metaphysically-idealistic and realistic features in Hegel’s dialectic must, at least from today’s perspective, appear unsatisfactory, especially if his method (and a corresponding cognitive strategy) can indeed be considered to have abolished the opposition idealism vs. realism.

Hegel’s epistemology, in my view, is simply of such theoretical quality that it – without generalizing labels and major contradictions – can be adapted to and further developed in modern (postmodern/poststructural) models of human thought. In such models one would assume that an important role is played by reason but that it is restricted to the very degree that it is correlated to experienced external reality. Accordingly, the perception of the latter is structured to an increasing degree by reason in the form of cognitive-pragmatic distinctions as these are activated and developed in the ontogenetic process conditioned by growing experience (and reflected on the level of understanding by Gadamer’s “effective historical consciousness”; 1989 [1975]: 282). This complex interplay, I would say, is the core of the Epistemological Problem and the very origin of the controversies about the oppositions reason vs. experience and ideas (concepts) vs. reality. It is on this interplay, obviously, that our efforts should be focused in order to give knowledge a more solid scientific foundation. The discussion so far allows us to assume that continued research in this field probably will make superfluous not only the traditional opposition idealism vs. realism but also the opposition rationalism vs. empiricism. The long series of more or less intuitive attempts so far to modify in various ways the traditional notions, of, for example, ‘realism’ (cf. ‘anti-realism’, ‘experiential realism’, ‘direct realism’, ‘metaphysical realism’, ‘internal realism’, ‘external realism’, ‘critical (hypothetical) realism’, etc.) indicates this unavoidable development. Also my own corresponding attempts over the years (cf. ‘cognitive realism’, ‘cognitive-pragmatic realism’, ‘experiential-perspectival realism’, and above: ‘abductive realism’) are likely to be abandoned in the light of new insights. It is important, however, that future hierarchical-processual models of thought and knowledge, based on cognitive-pragmatic distinctions, include also perspectival-interpretative mechanisms within the framework of an APPARATUS OF ABDUCTION at the very heart of all human activities. This cognitive-logical apparatus is assumed to regulate, in constant feedback processes, our perception and its intimate cooperation with all kinds of human action: physical, mental, and linguistic.
1.9 Searle’s ‘external realism’ and his objectivist interpretation of perspective

In the light of the perspectival-abductive model (see further 3.2) I consider it indispensable to reject the pronounced form of direct realism expressed in most explicit ways by John Searle (1999: 1–37, 39). Such a rejection is motivated by the fact that Searle’s so-called ‘external realism’ is irreconcilable with all we know today about the rational-interpretative and integrating role of cognition in the perception of reality (especially its fundamental spatial and temporal perspectivization), but in consequence is motivated also by Searle’s (ibid.: 20ff.) attempt to depreciate the corresponding significance of perspective for the nature of knowledge. Searle’s return to what he calls the “Enlightenment Vision” conflicts with Gadamer’s hermeneutics (see above, 1.6) and is, as far as I can judge, a relapse into mainly positivist thought (see esp. p. 24) and the corresponding dogmas of ‘representationationalism’ and the correspondence theory of truth. The latter two indeed raise the question whether Searle has definitely overcome the body-soul dualism or not (cf. Bickhard and Terveen 1995: 31ff.).

Searle’s entire argumentation is founded on his inability to distinguish clearly between ‘being’ and ‘way(s) of being’ (ibid.: 15; see also the discussion in 1.4). In this manner he exploits our natural presupposition that there exists an external world to convince us that we thereby can also experience directly what it really looks like. Therefore, it is particularly revealing when Searle (p. 5), without any further explanation, maintains that “Zeno’s famous paradoxes about space, time, and motion do not show [their] unreality.” If Searle instead had tried logically to explain these paradoxes (see, for example, the proposals below, 4.6.4), he would probably have realized that space, motion and time are nothing that exists out there in his ‘external reality’ but are human constructions of a fundamentally cognitive-metaphorical nature (see details below, for example, 3.16). According to this understanding, the concepts of space and time through their pivotal position in all human thought can actually serve as the weightiest arguments of all, precisely against all objectivist kinds of direct or ‘naive’ realism, without therefore being ascribed any a priori status.

Searle’s attack on perspectivism (p. 20ff.) is not well-founded, to say the least. Departing from his own idea of the possibility of “knowing reality directly as it is in itself”, he makes the astounding logical somersault by saying that perspectivism would be reconcilable with this idea on the condition “that it be known from no point of view”. This is of course a logical impossibility since the fundamental premise of perspectivism is that reality never can be experienced directly as it is in itself because it is always experienced from a definite point of view (cf. also Lukes 1982: 302, 304ff.; Winograd and Flores 1986: 32). Having created in this way a fictive opinion, he is in a position to ‘refute’ it by means of examples that superficially imply the pres-
ence of perspective and allegedly demonstrate its reconcilability with ‘realism’ and ‘epistemic objectivity’. In doing so, he overlooks completely that perspective is subjective in origin and thus essentially unlimited in its multifariousness. A necessary consequence for human knowledge is that it is essentially the outcome of subjective interpretations liable to constant changes. ‘Epistemic objectivity’ enters the scene only when, and to the extent that, the cognitive-linguistic system enables us to communicate knowledge from our own perspectives and confront it with knowledge derived from the perspectives of others.

There is no absolute knowledge and, consequently, no “real world that is totally and absolutely independent of all our representations” (Searle 1999: 14). Knowledge and reality are objective only in that sense and to the extent that we can agree on those interpretations that best explain the world and allow us to handle it. This implies no denial of the existence of the world, not even its independent existence, but it does imply that we cannot have knowledge about this world, that is, what it looks like, without this independence being reduced to a degree corresponding to this knowledge. But what sense does it make to speak of an independently existing world? None, as far as I can see if one does not need this abstraction from the world-mind system in order to defend the thesis of direct realism (and ‘scientific objectivity’). When Searle (p. 39) maintains that his ‘external realism’ “is not to be thought of as a theory” but rather as “a background presupposition”, he makes himself guilty of an obvious hierarchical-logical incongruity because he himself confronts his ‘external realism’ with competing ‘presuppositions’, or rather hypotheses, within clearly defined frameworks of knowledge theory (or meaning theory; Dummett 1987: 210; see below, 1.14) like ‘internal realism’ or mind-world interaction, subjectivity-intersubjectivity interplay, perspective, interpretation, fallibility (moderate scepticism), and so forth. It is obvious that Searle’s dilemma is a consequence of the same misdirected striving for ‘scientific objectivity’ as in Lorenz’s case (see also below, 1.19). Searle’s attempt to find this objectivity outside human subjects implies indeed that he rejects his own earlier (and apparently more fertile) ideas (cf. Searle 1984: 25ff.) like mind-body interaction, ‘mental reality’ and “subjectivity [as] an objective fact of biology”. Searle’s earlier insight “it seems to me a mistake to suppose that the definition of reality should exclude subjectivity” is now abandoned by him and he makes the same mistake himself when he (Searle 1999: 43–45) separates ‘epistemic subjectivity’ from the ‘epistemic objectivity’ of an absolute reality, instead of understanding the objective reality as the outcome of intersubjectivity. This criticism should not overshadow the impact of Searle’s early contributions to speech act theory (Searle 1969) on subsequent interactive models of language, as evidenced in particular by the development of AI and cognitive science (cf. Winograd and Flores 1986: 54ff.; Bickhard and Terveen 1995: 36–39, 247ff.).
1.10 A hierarchical reinterpretation of Popper’s ‘three worlds’, and the decline of ‘anti-psychologism’

Searle’s and Lorenz’s dilemma is reflected in a way by Popper’s struggle against ‘subjectivism’ and the role of ‘psychology’ in epistemological research. The latter’s attempt (Popper 1972: 153ff.) to overcome the dilemma by postulating three different worlds is essentially (even though he would have denied it) a provisional way of inductively creating a hierarchical order in the relationship between reality, thought, and language. However, in view of a missing processual coherence here, we are entitled to ask to what extent the numbering of the three worlds gives expression to a functioning hierarchical model. That ‘World 1’ represents physical reality one may understand as a tribute to philosophical realism, but how is this reality thought to be interrelated with human observers/speakers in the hypothetical-deductive, that is rather indirect-realist, model of knowledge advocated by Popper? How are, in other words, Popper’s ‘World 2’, that is subjective thought, and his ‘World 3’, that is objective thought, meant to be related to each other and to physical reality? Popper understands his essentially static-discrete system of three different worlds (reminding one, actually, to some extent of Peirce’s universal categories: Firstness, Secondness, and Thirdness; see 4.7) as representing philosophical pluralism, in contrast not only to Cartesian dualism but also to what he in Hegel sees as ‘tendencies to monism’.

According to my interpretation, the decisive distinction between Popper’s pluralism (as conceived here) and the integrative mind-world monism, which I would rather advocate in the spirit of Hegel (see above, 1.5–7), is of a fundamentally methodological nature, viz., whether we apply a hierarchical-static or hierarchical-processual perspective to the mind-world relationship. The latter processual view may perhaps be said to inhere potentially in Popper’s description of ‘World 2’ as mediating between ‘World 1’ and ‘World 3’, which according to him lack ‘direct interaction’ between each other. In a constructive interpretation, Popper’s three worlds might be understood thus as a provisional-inductive expression of three corresponding levels in a uniform and superordinate abductive system (see 3.2) that integrates induction-deduction in a hierarchical-processual manner. The individual worlds (and their numbering) would of course drop out in such a system, since its processes are characterized by circular feedback and may commence (due to a change) at any level of the system, including the perceptual-sensory one. In this system one may thus assume (in harmony with Gadamer’s view as presented above; cf. also Gadamer 1989 [1975]: 472) an integration of subjective thought (the subjective perspective) and objective thought in the sense of logically-linguistically founded cognitive-pragmatic intersubjectivity. Without this reinterpretation Popper’s dilemma would remain, since by ‘World 1’ he actually postulates a reality in itself, which through its exclusive object-nature is incommensurable not only with ‘World 2’ and ‘World
3’ but also with Popper’s own thesis that “all knowledge is theory impregnated” (Popper 1972: 104). If we accept this thesis (and I see no problem doing so), that means that to human observers no physical reality can exist in itself, i.e., that is not theory impregnated, and consequently subject-independent. This demonstrates that ’World 1’ cannot sensibly be abstracted from ’World 3’ (even in the case of ‘mediated’ interaction), but rather indwells in the latter, precisely as ’World 2’ (subjective thought) indwells in ’World 3’, understood as general intersubjectivity (see above).

My conjecture is that these conditions, if they should be confirmed, can be handled only in a model of hierarchically embedded processes with prominent feedback mechanisms. Against the background of the previous discussion it appears reasonable to assume that Popper’s problems decisively depend on his model’s lack of an explicit integration of perception as a dynamic carrier precisely of ’theory impregnated knowledge’. The latter would then, in my view, be understood, more specifically, as the outcome of the complex interaction of subjective experience and logically-linguistically founded cognitive-pragmatic intersubjectivity (rather than absolute objectivity) in the human interpretative exploration of reality. Such a dynamic interaction was out of reach of Popper’s (ibid.: 104ff.) rather static understanding of the role of subjective (’common sense’) knowledge as opposed to ’theory impregnated’ and ’conjectural’ knowledge, viz., as expressions of idealism vs. realism (“and its (biological) theory of knowledge”), respectively.

On this basis the traditional banning of ’psychology’ from philosophy (and natural sciences), embraced by Popper (as well as Morris; see 5.2), can be abandoned as essentially unjustified. Psychology, especially cognitive psychology, should, on the contrary, to a greater extent than ever be a constitutive part of basically all epistemology, whether it directs its main attention toward subjective or intersubjective knowledge, or their hierarchical-processual integration and correlation to perception. Apel (1987: 256, 276, 285) appears to take a similar position, although he also gives proofs of relapses into excusing references to ’psychology’ (p. 272). Husserl’s (1900: 50ff.) anti-psychologism was founded on his inability to see the processual interdependence between subjective and intersubjective knowledge. This interdependence, however, was part and parcel of Mead’s (1937) ’objective realism’ (within his philosophical framework of experiential realism; ibid.: 246ff.) and his corresponding correlation of private and common experience (cf. Morris 1937: XIX). Mead (ibid.: 89ff.) even actualized in a thought-provoking way the role of perspective relative to meaning and universality (see the detailed discussion in 1.16).
1.11 Analytical vs. synthetical knowledge, philosophy of language, and the implications of Zinkernagel’s *Conditions for Description* for an abductive epistemology

If we return now to the idea of synthesis as discussed above in Kant, or perhaps rather in its dialectical function in Hegel, it should be noted that it is applied in Husserl’s (1913: 73, 75, 245ff.) phenomenology, as well. Here cognition, that is intentional consciousness, is understood as constituent ‘syntheses of identification’ performed by hierarchically ordered acts of perception and recollection. It is obvious that Kant’s detachment from ‘the thing in itself’ and his displacing the perspective from the experienced reality to the experiencing subject has an analogue in Husserl’s focus on the acts of consciousness and the subordination of physical reality. The fact that Kant’s synthetical a priori knowledge can be questioned and that, in my view, his distinction between analytical and synthetical a priori knowledge accordingly can be replaced by a unified processual hierarchy of cognitive distinctions (innate and acquired, respectively, in this order), is also something that appears to be reflected to some extent by Husserl (ibid.: 59, 108ff.), viz., by his so-called *phenomenological reduction*, that is, the step-wise tracking back of knowledge to the experiencing subject, Husserl’s ‘transcendental Ego’. However, this is a subject abstracted from the perspective of the truly individual subject, and thereby in essence also from Husserl’s own conception of ‘life world’ (*Lebenswelt*). Husserl’s epistemological project does not suffer as much from subjectivism (or solipsism), as is usually maintained, as from the lack of clarifying interaction between subjective and intersubjective knowledge. His dilemma arises, on the one hand, from his idealist ambition to establish an unprejudiced (‘pure’) description of human knowledge, and, on the other, from his insight that this knowledge (in accord with his ‘life world’ conception) is all but unprejudiced. This logical contradiction can be overcome only if we realize that the former enterprise is illusory, and that we, in consequence, rather include prejudices, that is, perspective-dependent, knowledge. For an opening toward a perspectival reinterpretation of Husserl’s phenomenology, see Ch. 6.

Quine’s (1961 [1953]; see below, 1.12) opinion that a critical discussion of Kant’s distinction between analytical and synthetical knowledge is an indispensable point of departure for modern theory of knowledge can, as we shall see, be said to be confirmed also by the Danish philosopher Peter Zinkernagel’s (1962) *Conditions for Description*. Zinkernagel’s attempt to found epistemology on a coherent philosophy of language, influenced in important respects by the late Wittgenstein as well as Gilbert Ryle, has, in
spite of its originality, received astonishingly little attention. One of the relatively few researchers that recognized the significance of Zinkernagel’s ideas was the Swedish sociologist and philosopher Joachim Israel (1990; 1992: 92ff.).

Zinkernagel formulated his theses inspired in part by Niels Bohr’s understanding of the epistemological preconditions for the natural sciences, more specifically, the dependence of physical reality on human language and thought. According to Bohr, as pointed out by Israel (1990: 44), it is not the task of physics to find out what nature is like but to explore what can be said about it. One of Zinkernagel’s (ibid.: 5ff.) theses finds its expression in the following formulation: ”[...] epistemological problems disappear when we realize that geometry and physics are, above all, precise rules for the use of words already found in ordinary language, and that therefore no fundamental contrast exists between ordinary language and scientific concepts, however much the formulation of scientific concepts diverges from the world of everyday concepts.”

What Zinkernagel wants to say is (in a relative interpretation), apparently, that fundamental epistemological problems can be better understood if we assume that scientific descriptions must rely upon the same ordinary language as everyday descriptions do, but that the former – as distinguished from the latter – are subject to ‘precise rules’ for the use of language. Now, the condition that ordinary language of necessity is ambiguous, or polysemic, by nature, whereas scientific language normally presupposes unambiguous definitions is, in my view, of subordinate significance in this connection. Besides, I do not believe (in an absolute interpretation) that epistemological problems disappear in any fundamental sense because of this insight.

More important is how we are supposed to understand in Zinkernagel’s use such notions as ‘word’, ‘language’ and ‘concept’, as well as their interrelations. ‘Words’, in a linguistic analysis, represent surface phenomena, mainly lexical units, derived properly speaking from underlying cognitive-pragmatic and semantico-syntactic structures. Such derivation may be assumed to take place according to rules common basically to both scientific and ordinary language. The ‘precise rules’ of scientific language from this point of view are a phenomenon of secondary, definitional-lexical origin. The fundamental rules are the same and constitute the ‘language’ common to both as system. This is why there arises a logical asymmetry when Zinkernagel places ‘(ordinary) language’ and ‘(scientific) concepts’ on the same level, unless he identifies linguistic structure (‘words’) with conceptual structure. But then linguists see a problem, viz., the same problem that adhered to traditional philosophy of language all the way from Frege and found its expression in Ryle’s (1964 [1953]: 39) opinion that the questions discussed by the Oxford philosophers can be understood as an analysis of concepts as well as of language. But since it is Zinkernagel’s (1962: 11) episte-
mological goal to investigate the general conditions for description in the form of a "logic [...] common to different languages", it is obvious that it is not the use of 'words' or even 'concepts' as such that should be the prominent object of research, but the system of rules which is the prerequisite for the genesis and use of concepts on the whole. If these 'rules', or rather cognitive-pragmatic distinctions in a system of hierarchical relations and processes, are universal by nature, it appears arbitrary to speak of 'language rules' in an unqualified way. The underlying idea is naturally that language and thought cannot be separated, but languages besides universal features display also specific features that, to the extent that they are not formal-conventional, are incompatible with a totally uniform cognitive system (for a reference to the Sapir-Whorf hypothesis, see 4.6.8).

These conditions do not, I emphasize, speak in favour of the autonomy of the cognitive (universal and specific) system from language but demonstrate the need for a clearer hierarchical differentiation of the integrated cognitive-linguistic system. Within the framework of such a hierarchical understanding we cannot generally presuppose that cognitive activities, for example on levels associated with certain emotional states or perceptual-sensory capacities and strategies of a primordial nature, are dependent on linguistic structure. Below I intend to develop the view that the failure of analytical positivism was rooted in the idea of a one-to-one relationship not only between language/thought and reality but also between language and thought. 'The reach of language' can thus be shown to be relativized by the dynamic interaction between the requirement of cognitive-linguistic invariance (intersubjectivity) and the factual variance in the perception and cognition of reality by the individual subject (the subjective perspective).

However, to the extent that cognitive capacities have arisen (been activated), developed and function in symbiosis with language, they are of course linguistic, or rather language-dependent, in a processual sense. One of the advantages of Zinkernagel's (1962: 31ff., 49) treatment is that he (like Hegel) makes a distinction between precisely such cognitive (informal) 'logical' capacities, on the one hand, and those which, according to him, derive from these, viz., so-called (formal) 'logical constants', on the other. In this way Zinkernagel actually expresses a hierarchical view of cognition such as it is present in my integrative hierarchical-processual understanding of thought and language, at the same time as he is able to account for Kant's distinction between empirically founded synthetical knowledge and analytical a priori knowledge, respectively. It is an open question to what extent (in which cases) analytical a priori knowledge shall be understood as innate or as ontogenetically abstracted from synthetical knowledge (and, according to my view, through feedback conditioning the latter). Zinkernagel considers only the latter possibility and regards also analytical knowledge generally to be derived empirically (see the further discussion below). The essentially hierarchical understanding one might ascribe to Zinkernagel tends to be ob-
squired by his speaking in both cases of 'linguistic rules' (p. 53), viz., in the
case of informal logical capacities – of 'more specific linguistic rules', in the
case of formal logical constants – of 'general rules of language'. Even if we
understand also the latter (as, for example, the law of contradiction) as pre-
conditions for the rise and use of language, they are so, I would say, above
all in their capacity as preconditions for cognition. Are we entitled thus – in
cases of phylogenetic heritage – to exclude completely the autonomous ex-
stistence of fundamental logical rules? Would not this prevent us from seeing
them (as, for example, in the case of negation, based as it is on the law of
contradiction) activated also in the ontogeny of prelinguistic perception and
cognition in human children, and in other biological species as, for example,
‘intelligent’, but languageless primates? This is apparently what Bertrand
Russell (1948: 421) must have had in mind when he said: “There is another
thing which is important to remember whenever mental concepts are being
discussed, and that is our evolutionary continuity with the lower animals.
Knowledge, in particular, must not be defined in a manner which assumes an
impassable gulf between us and our ancestors who had not the advantage of
language.” For equivalent standpoints, see Lieberman (1984: 332) and
Lakoff and Johnson (1999: 4). Russell’s view can actually be understood as
anticipating the subsequent discussion of the evolutionary biology of cogni-
tion and language, more specifically, of processes of preadaptation
('exaptation') of neurocognitive capacities charged with new tasks and inter-
acting with processes of selection through adaptation to the environment (cf.
Kimura 1979; Lieberman 1984: 68ff., 331; Pinker and Bloom 1990; Pinker
1997; Givón 2002a: 147).

Bearing in mind the above reservations, we may still understand
Zinkernagel’s Conditions for Description as a serious attempt to prepare the
ground for a more adequate understanding of human thought and language
by positing a hierarchically ordered system of formally logical and inform-
ally logical, that is cognitive-linguistic, rules, respectively. As prerequisites for
the description of our experiences of reality, these rules, according to
Zinkernagel (1962: 39), cannot be isolated from reality itself: "It has been a
dominant tendency in the philosophy of the last few centuries to assume that
we could, and had to, distinguish between statements about language on the
one hand, and statements about reality or about experience on the other. We
must abandon that assumption if it is justified to say that there are general
conditions for description.”

Within the framework of this basically ‘anti-realist’, or rather cognitive-
realistic, understanding (cf. also p. 38), which is reconcilable with an inte-
grative processual hierarchy of binary distinctions and a corresponding in-
terpretation of Hegel’s dialectical movement, it is natural that Zinkernagel
(p. 39ff.) also takes a closer look at the distinction between analytical and
synthetical knowledge. One consequence of his general conditions for de-
scription is, according to him, that one has to abandon the view that analyti-
cal propositions (as distinguished from synthetical ones) should not be concerned with reality. However, Zinkernagel’s conclusion (for which support can be found in Quine 1961 [1953]), in my view, has to be qualified insofar that a distinction is made between propositions and knowledge. In the case of propositions we must as a rule presuppose the actualization of a determinate reality. In the case of knowledge, however, not (not yet) realized in the form of propositions, the connection with reality appears indeterminate, since the naturally higher degree of abstraction in analytical knowledge allows of its potential application to various instances of reality. These different, but interrelated, functions of analytical knowledge are actually a natural consequence of the pivotal feedback mechanism of the hierarchical-processual model, obviously overlooked by Zinkernagel, but not by Hegel.

Now, this situation implies that analytical knowledge hierarchically-processually conditions (is realized by) synthetical knowledge and that both (through feedback interdependence) are constitutive phases of one coherent cognitive, viz., abductive (see 3.2), process rather than distinct cognitive strategies; and, consequently, that the distinction analytical-synthetic in the traditional sense can (in harmony with Quine’s suggestion; 1961 [1953]: 20–37, esp. 36ff., 43, 46) be abandoned altogether. Kant’s application of the distinction a priori vs. a posteriori to the distinction analytical vs. synthetical must be subjected to a corresponding modification. If it can be demonstrated thus that synthetical a priori knowledge, as in the case of the pivotal concepts of space and time, can be abandoned as an ad hoc solution for truly ‘a posteriori’ processes (see 3.13), the consequence will be that the distinction a priori vs. a posteriori can also receive an unambiguous hierarchical-processual, viz., biopragmatic, interpretation. Under these circumstances the a priori concept can with advantage be replaced by hypotheses of genetically inherited cognitive capacities, and the a posteriori concept by corresponding hypotheses of their ontogenetic activation and development represented by a system of rules on the empirical basis of environmental/cultural learning. This conclusion finds support in Zinkernagel’s opinion that "the knowledge of [general conditions for description] cannot be characterized as a priori knowledge, which concerns only our words and concepts, not experience" and thus "the distinctions between a priori and a posteriori knowledge cannot be applied to statements about the conditions for describing experience.” As a consequence of Zinkernagel’s empirical understanding also of analytical knowledge (cf. also Quine 1961 [1953]: 43), his opinion may thus also be applied to fundamental logical constants, although one should not probably exclude their being to some extent transcendental, that is in the sense of phylogenetic dispositions. In its integrated, hierarchical-processual function demonstrated above (with reference to Hegel and Gadamer), the analysis-synthesis strategy remains in force, however, as the central epistemological instrument in the constant movements of coherent perceptual-cognitive-actional feedback (see 3.2).
This dynamic understanding may, as indicated above, be said to be reflected more generally in Gadamer’s (1989 [1975]: XXXV, 175, 190–92, 198, 291, 471) textual-hermeneutic conception of a "circular relationship between the whole and the parts", more specifically, "the hermeneutic circle of whole and part, which is the starting point of [this] attempt to lay the foundations of hermeneutics" (p. XXXV), as well as his corresponding, pronouncedly dialectical, view of understanding (p. 190; cf. also 465ff., 472) already referred to above.

The question Zinkernagel chose as point of departure for the development of his philosophy of language thus was the following: "Are there, besides formal logic, other rules of language whose denial renders any descriptive sentence unintelligible or unfit for use in description?" Although he admits that "it will be far more difficult to explain and account for the rules of language [...] than it is to explain and account for the elementary rules of formal logic", he gives a positive answer to this question by suggesting three fundamental postulates for the content of these 'rules of language' (p. 51ff.). They can be summarized so that they describe a circle of dependence between concepts that begin and end in the category of 'things', but also include the category of 'possibility' (both known from Kant’s transcendental philosophy). By embracing also concepts like 'action' (possibility of action), 'mental states' and 'human bodies', these postulates represent in effect a basically cognitive-pragmatic kind of realism. In brief, Zinkernagel postulates that (1) designations of ordinary things and possibilities of action cannot be used independently of each other; (2) designations of mental states cannot be used independently of designations of persons; (3) designations of persons cannot be used independently of designations of bodies, and, consequently, of designations of ordinary things.

Even though one is willing to perceive in a constructive spirit these proposals to define the fundamental problems with which we are confronted when approaching the essence of knowledge via the only possible gate of access, that is language, one still cannot close one’s eyes to the remaining restrictions of this kind of language-philosophical platform. It posits the question what can meaningfully be said about reality, but presupposes (p. 119, 129) that the answer to this question also tells us what we can meaningfully think about this reality, what we on the whole can know. I am afraid this is wishful thinking as long as we are unable to transcend these postulates and Zinkernagel’s restrictedly inductive explications of them, and establish a hypothetical-deductive, or rather abductive, coherence between language and thought. Zinkernagel’s model has not yet freed itself entirely of traditional philosophy of language. It can, consequently, account more or less for what can meaningfully be said about things, actions and thought, but not for what may be assumed to take place (what we have to know) when we do act, think and speak. Above all, a philosophy of language with truly epistemological ambitions must in more convincing ways than this is the case in
Zinkernagel's model (ibid.: 217, 257) be able to incorporate coherently human perception with human action (physical, cognitive, linguistic). Preconditions for this further step appear to be present in Zinkernagel's (pp. 91ff., 117, 128) basically cognitive-pragmatic understanding of the essence of perception (and reality) as expressed by his three postulates or 'rules' (as he also calls them). The latter (and their explications) would have to be modified thoroughly in a hierarchical-processual model including perception. An embryo of dynamics can still be said to inhere in Zinkernagel’s implicit introduction of change-of-state conditions in his discussion of the concept of action, more specifically in terms of "an alteration of our possibilities of action" (pp. 58, 63). However, what is more important from a point of principle, and makes Zinkernagel’s contribution so significant, is that he, as distinguished from both Frege and the Oxford philosophers, unambiguously understands objectivity to be traceable in "[the] investigation of certain fundamental concepts" (pp. 119, 148–55, 185, 254).

On this basis I interpret Zinkernagel’s contribution to epistemology above all as substantial support for cognitive hierarchization and mind-world interaction, consistent in turn with the ideas of processuality and feedback derived above from Hegel’s dialectical movement. It is for this condition I would say Zinkernagel is due special credit rather than for the explicit 'conditions for description' or 'fundamental concepts' he suggested. The need to modify and complete the latter (already at this inductively-explicatory stage of analysis) was demonstrated also by Israel (1990, 1992), but the question is whether such a development would lead to a real breakthrough without the paradigm shift anticipated by Hegel’s dialectical coherence. Especially Israel’s (1990: 105, 128) rejection of a hierarchization of cognitive-linguistic ('linguistic-logical') distinctions or rules and his corresponding view of these merely in terms of static-superficial "relations between [linguistic] expressions" (ibid.: 104) render difficult their integration in systematic processual-explanatory models of human knowledge (e.g., as applied to 'language universals' in Givón 2002a: XVII; cf. Dummett’s criticism of Austin’s practice of linguistic philosophy; Dummett 1987: 192, 197ff.; see the discussion below, 1.14). Nevertheless, Zinkernagel’s and Israel’s contributions to philosophy of language, in my understanding, are important steps away from the positivist treatment of language by formal logic as practiced predominantly within analytical philosophy.

1.12 Quine’s holism as a first step away from language-philosophical positivism

Willard van Orman Quine’s (1961 [1953]; 1960) contributions in this direction (though still within the framework of analytical philosophy) were defi-
nately more decisive. If we overlook the empiricist-behaviourist elements in his philosophy of language (and the corresponding suppression of the rationalizing role of cognition, viz., as alleged expression of ‘mentalism’) and rather focus on the conception of holism as the foundation of his epistemology, we can see that this conception actually represents a developed relationship of logical interdependence between language/theory (implicitly, cognition) and experience. Quine’s holism (in the metaphorical image of a field with a centre and a periphery bordering on experience) thus in essence ascribes to this relationship both hierarchical order and feedback. It embraces not only the dependence of language/theory on experience, but (at least tendentially) also the other way around. However, since all our knowledge, according to Quine, is underdetermined by experience, there is room for different interpretations of such experiences which conflict with theory. This condition, I would say, is rather caused by a more fundamental perspectival-hermeneutic dependence of all knowledge (all theory formation), viz., in the sense that interpretations of experiences primarily always express the subjective perspective or choice of the individual speaker/theoretician, entirely neglected by Quine, but do so in feedback with the overall model of reality that the human subject embraces as a result of accumulated knowledge, characterized to a high degree by intersubjectivity (that is, the ‘opinion’ so far agreed to by a given community of speakers/theoreticians). To explore knowledge more closely precisely as the realization of the dynamical relationship between subjective perspective and intersubjectivity would, in my view, accordingly be a first rank task for today’s epistemology.

Quine's (1961 [1953]: 42; 1960: 275ff.) ‘naturalization’ of philosophy seems to be a logical and on the whole fruitful consequence of his holistic epistemology and far-reaching dispute with language-philosophical positivism, were it not for its behaviouristic restrictions (cf. the criticism in Lakoff and Johnson 1999: 461). It can, like Habermas’ New Paradigm, be understood to suggest the transformation rather than the ending of philosophy. However, in this transformation Quine appears still to trust man’s empirical ability more than his rational ability. The question is whether he in all respects succeeded in freeing himself from positivist thought (cf. the criticism in Putnam 1987a: 235–39; see also 1.15). His overconfidence in the natural sciences and corresponding belief that language enables an objective experience of physical reality in terms of truth values actually contradict his own idea that no language/theory is neutral. The reason for these incongruities I would ascribe to the circumstance that Quine’s holism still lacks such a processual coherence (see 1.16) that would allow us to incorporate in logically consistent ways the functions of hierarchy and feedback, tacitly implied by him, but also to integrate in all-embracing ways the hermeneutic component observed by himself (as well as the underlying interplay of subjective and intersubjective knowledge). The preconditions for such a refinement of Quine’s paradigmatically novel understanding of knowledge are doubtless
present, if we interpret his empiricism as conditioned by rationality to a greater extent than he is willing to admit, viz., in terms of the pragmatically determined ‘convenient conceptual schemes’, which he, deviating from Carnap’s position, considers constitutive of both scientific hypotheses and ontological questions (cf. also Quine 1961 [1948]: 16ff.).

In a circular-dialectical feedback model of knowledge, including of necessity perception (see 3.2), we do not need to seek reality (and the foundation of philosophy) in any determinate, hypostatized phase of the coherent movement of knowledge, which would be the case on corresponding static-hierarchical levels. If one rejects Apel’s ‘indubitable evidence’ in his ‘transcendental pragmatics of language’ as such a ‘rational’ candidate of an idealist nature (see above, 1.7), one must conversely be doubtful about Quine’s references to sensory experiences as selected ‘empirical checkpoints’ and the closest we can get to reality (and an absolute foundation). All references in the latter connection to biological-evolutionary, neurophysiological, neuroanatomical, neurocognitive, neuropsychological, etc., conditions – however important they may be – can never be understood and assimilated unless (in accord with the principles of holism) integrated into a hierarchical-processual (phylogenetic as well as ontogenetic) relationship of interactive feedback with the other phases of the overall model, including socio-cultural conditions (see 1.15, 1.17). Otherwise there is a risk that we end up in new forms of positivist empiricism and materialist (biologist) realism, and – in consequence – philosophical isolationism.

1.13 The symbiosis of cognition and physical/linguistic action in the holistic model of knowledge and reality

In the overall movement of knowledge, language – once we have learnt it – holds a unique position in the sense that it, from a phylogenetic as well as ontogenetic point of view, transcends (in a system-immanent sense) its primordial role as parallel form of action, subsidiary to physical action in a social (elementarily communicative) context and corresponding primitive forms of cognitive action, based primarily on functions of deixis and iconicity. This transcendence of language, connected mainly with its successive development of the symbol function and the corresponding growth of man’s power of abstraction (probably initiated already as the uncomplicated rationalization of elementary emotional states; see 3.15), more specifically the combination of this ability with the spatio-pictorial forms of thought, has the following consequence: language is tied successively (and irrevocably) not only to cognition but also – through the latter – to physical action. This leads to what Rorty (1987 [1982]: 34) refers to as “the ubiquity of language”, that
is, if one chooses to focus on language as *one* form of action (in a broad sense).

Apart from reflexive behaviour, physical action as a rule is intentional and thus correlated to the cognitive, and thereby also linguistic, structuring of reality (including non-communicative contexts). The transcendence of language thus implies that it, in symbiosis with cognition, consciously or unconsciously, is constantly present also in physical action, but not necessarily the other way around, since we may imagine cognitive-linguistic structuring of reality without (the realization of) physical action, that is, that does not belong to this structuring itself (like facial expressions, gestures, lip movements, external monologue, etc.). In this lies man’s ability to transcend, at least to a certain extent and within the scope of human perception, those limits of thought and language that were dictated by biological evolution (and still basically are), that is, primarily by action as a prerequisite for adaptation and survival (cf. Piaget 1960: 7).

The specific role as form of action played by language through its symbiosis with cognition has the consequence that man’s analysis of physical things and actions (events) in the world to a great extent is dependent on those cognitive categories which are accessible through language. In a corresponding way we have as a rule no direct access to our thought, but only through language. However, when, by tradition, one speaks of the power of language over thought, this is only half the truth. *It cannot, as evidenced by the ambiguity caused by perspectival-interpretative processing and the systematic polysemy of language* (see 1.15, 4.2), *be entirely true* (as Rorty maintains; 1987 [1982]: 33) *that we cannot think something that we cannot express linguistically*. On the other hand it appears to be true that without the aid of language we cannot reach the depth and complexity of thought that enable us to discover new, almost unlimited, possibilities of interpreting reality. However, this symbiosis does not imply any one-to-one relationship (see 1.14). Therefore it appears futile to choose between a philosophy of consciousness or mind (‘mentalism’), on the one hand, and a philosophy of language, on the other. In a way we need both, viz., in such forms of synthesis that make them commensurable – with each other and within a holistic model of knowledge and reality. Otherwise the risk is that we end up in some kind of epistemological reductionism.
1.14 The legacy of Frege’s static-positivist philosophy of language and knowledge, and the flaws of Dummett’s objectivist theory of meaning: the need for interaction between subjective and intersubjective knowledge – and for a new concept of truth

Against the above background we understand better in what way Michael Dummett’s (1987) systematic conception of philosophy, more specifically, of philosophy of language – as derived by him from Frege, regards the analysis of language as a prerequisite for the analysis of thought. Abstracted from the individual subject, thought is the fundamental component of the intersubjective, cognitive-linguistic system. However, the question arises: how can from a systematic point of view intersubjectivity come into being without underlying subjectivity? Does not the demand for systematicity imply that we account of necessity for the interaction of the two? Here, Dummett (1987: 195, 215), in my view, uncritically takes over Frege’s static-positivist view of philosophy of consciousness (mind) as representing exclusively something subjective, whereas it in fact can and should – in a dynamic model – be considered to include both subjectivity and intersubjectivity, viz., in a hierarchical feedback process of integration. The former view is based on the misunderstanding that merely thought, communicated without residue by language, is of epistemological relevance. However, language as an intersubjective system of rules is no guarantee for the understanding without residue of encoded thought, for the simple reason that the latter is based on a subjective perspective – in a broad sense (individual experience, emotional background, intentions, expectations, etc.). Such thought can be communicated, that is, understood, only to the extent that the Other also understands – can be made understand (not necessarily share) – the underlying perspective of the speaker. It would be unreasonable to maintain now that epistemology should restrict itself merely to those cases where understanding can be attained from a joint perspective, while neglecting other cases. Understanding, to be sure, is dependent on knowledge, but precisely in the broader sense including both one’s own perspective on reality and the ability to put oneself into the perspective of others on this reality.

If, according to Dummett, a theory of meaning, understood as prima philosophia, is equivalent to a theory of understanding, it must account somehow for the role of perspective and the corresponding interaction between subjective and intersubjective knowledge. The idea of a theory of meaning as the foundation of philosophy, in my understanding, is dictated in essence by Dummett’s inductive view of the relationship between language and thought: “What a theory of meaning has to give is an account of what it is someone knows when he knows the language” (Dummett 1975: 99). This definition completely overlooks the condition that the intersubjectivity of
language is not generally part of any one-to-one relationship to a corresponding epistemic intersubjectivity. Such a relationship we may probably expect only on certain fundamental hierarchical levels where presumably universal, and perspectiveless, cognitive distinctions make up the preconditions for subsequent perspective-dependent distinctions and analyses which issue in communicable syntheses/interpretations. A general one-to-one relationship cannot exist for the simple reason that language by definition represents the intersubjective conformation of diversified thought, subjective as well as intersubjective. The extensive cognitive-pragmatic ambiguity of language, as well as its polysemy (neglected not only by philosophers but often also by professional linguists; cf. Thelin 1999: 247), represent the neutralization of certain both subjective and intersubjective cognitive (not to mention emotional-evaluative) distinctions. To dispute the legitimate concern of epistemology for these distinctions would be as infertile as to question the concern of linguistic semantics for the cognitive-pragmatic structures underlying ambiguity and polysemy.

The ideas behind expressions like ‘the power of language over thought’ and ‘access to thought merely through language’ will be easier to understand if put in a dialectical connection of constant circular feedback between language and thought. Then it becomes more transparent how we continuously turn to language to find, to the utmost possible extent, expressions that communicate various features of our thought, and, conversely, continuously turn also to thought and, with the aid of language, structure it (by means of constant analysis/synthesis) and refine our interpretations of reality. By this interplay we strive to overcome the restrictions of linguistic expressibility at the same time as we utilize language to extend the limits of our thought. This process is unthinkable without the input represented by the sensory experiences and the corresponding subjective knowledge of individuals. It is the task of epistemology to correlate the latter to the intersubjective knowledge manifested by language. In the static-positivist view of knowledge, which Dummett (1987: 195) after all inherits from Frege, these conditions of individuality/subjectivity are conceived of as something alien to epistemology: "If the philosopher attempts […] to strip thought of its linguistic clothing and penetrate to its pure naked essence, he will merely succeed in confusing the thought itself with the subjective inner accompaniments of thinking.” This, in my view, is just another example of the same infelicitous striving demonstrated so frequently in the history of philosophy, viz., for an objectivity that is not to be found.

Under these conditions one also realizes that Dummett’s idea (ibid.: 210) that “the philosophy of language is the foundation for all the rest of the philosophy” and that the primary task of philosophy, accordingly, is to formulate a "systematic theory of meaning" – however fruitful this idea is – must be relativized against the background of a broader context, viz., the dialectical feedback process involving not only language and thought but also per-
ception and physical action. ‘Philosophy of language’ may then turn out to be too narrow a designation of the study of the circular-dialectical overall process that merely from this restricted philosophical perspective commences in language. In reality, one should rather see the global task of philosophy as ‘mediating interpreter’ (see 1.1) in the overall analysis/synthesis of experiences regarding all phases of this process, as manifested by the ‘empirical’ sciences involved, above all: semiotics, linguistics, poetics, sciences of art, anthropology, sociology, history, psychology, neurosciences, biology, chemistry, physics and mathematics – in their various and often interdisciplinary variants.

In a corresponding way, a theory of meaning, dictated by ‘philosophy of language’, may turn out in turn to be too narrow a designation of a holistic theory of knowledge that involves all these disciplines (and probably some more), that is, unless understood in a more general semiotic sense (including also theories of perception and physical action). Such a broad understanding would possibly still be consistent with Dummett’s ‘anti-realist’ philosophical program. A corresponding holistic-semiotic view of meaning as basis of (cf. Dummett 1979), or, in my understanding, rather substitute for, traditional metaphysics, would of necessity modify the role of language and propositional structure for the concepts of knowledge and truth. At the same time as the concept of knowledge is thus broadened, the concept of truth receives a broader epistemic meaning, beyond the absolute truth conditions of propositions and the corresponding objectivist-realist view of reality. Dummett’s (1987: 208ff.) corresponding suggestion to replace the concept of truth with that of justification is under certain circumstances (see also below, 1.17) in line with the holistic-dialectical theory of knowledge sketched above and may be regarded as reconcilable with the perspectival-hermeneutic view of knowledge advocated here.

Under these conditions a ‘systematic theory of meaning’ and an accordingly modified concept of truth can actually be said to be implied (replaceable) by a systematic (in a non-foundationalist, rather coherentist, sense; cf. BonJour 1985: 99; see also below, 1.18) epistemology in the form of a pragmatic, more precisely, biopragmatic semiotics. This interpretation, to be sure, demands a more dynamic understanding of ‘justification’ in so far as it has to make a distinction between non-justified growth of knowledge (in agreement with the principles of natural selection), on the one hand, and the justified use of knowledge in propositions and actions, on the other. The existence of both (usually overlooked in evolutionary epistemology; cf. Popper 1963: VII, 29, 51, 225, 228ff.; Bartley 1987: 24ff.) would, however, in the present model presuppose their hierarchical integration as a natural expression of the successive process of selective retention and expansion (in a non-absolute sense) of knowledge as a result of trial and error (or ‘conjectures and refutations’; Popper 1963: 46). This solution would, in other words,
amount to the dynamic interdependence of *discovery*, on the one hand, and *justification* as a function of *norm*, on the other.

1.15 Conceptual schemes and the distinction between culture-dependent and culture-independent reason: Putnam’s pragmatic realism in the light of hierarchical-processual interaction and the perspectival correlation of subjective and intersubjective knowledge

The conception of epistemology sketched above may, to some extent, be understood as reconcilable with Hilary Putnam’s (1987b) philosophical project and its point of departure in ‘common sense realism’. Earlier Putnam (e.g., Putnam 1981) referred to this project as ‘internal realism’, but later (cf. Putnam 1987b: 17) preferred to speak of ‘pragmatic realism’. In reality, both notions, in my interpretation, point to two fundamental components in Putnam’s view of realism (“that takes our familiar common sense schemes, as well as our scientific and artistic and other schemes, at face value”), viz., conceptual schemes, on the one hand, and the background of socio-cultural and linguistic practice, on the other. These notions still remain a simplification, of course, since they do not convey the actual interdependence of the two components. Conceptual schemes (‘theories’), according to Putnam, are determined in part by the background of socio-cultural and linguistic practice. This view is reflected by Putnam’s (1987a: 228, 242) analysis of *reason* (realized by conceptual schemes) into one ‘transcendent’ and one ‘immanent’ part, that is, one culture-independent and one culture-dependent part, respectively. This distinction corresponds in the dialectical-processual feedback model of knowledge, proposed here, to the hierarchical differentiation between the system of basically universal cognitive capacities and distinctions (including logical constants), on the one hand, and the system of culture-dependent cognitive distinctions, on the other. Whereas factors dictated by biological evolution may be assumed to play an important role on the whole only for the former system, we probably must assume that pragmatic factors may be of a universal as well as a culture-dependent nature.

By not neglecting bioevolutionary and corresponding phylogenetic conditions – to the extent that they may be considered relevant – a model of human knowledge, such as the one suggested here, can no doubt be understood as implying a corresponding ‘naturalization of epistemology’. When Putnam (1987a: 223) in general terms dismisses such ‘naturalization’, and more specifically ‘evolutionary epistemology’, as evidence of ‘metaphysical realism’ and the correspondence theory of truth, this is obviously the outcome of his simplified and static understanding of the complex of interrelations from
which the concept of knowledge has tacitly been abstracted – and isolated. He therefore apparently overlooks the possibility of interrelating in a hierarchical-processual model – without the alleged implications – biological, pragmatic (including socio-cultural), cognitive and linguistic components, and doing this in ways that would be more in line with his own (1987b: 1) essential conception of interaction: “the mind and the world jointly make up the mind and the world.” As demonstrated by the above presentation, Putnam’s argument that ‘naturalization’ necessarily leads to a reduction of “‘intentional’ or mentalistic notions to materialistic ones” under these circumstances can be said to be disqualified. This applies also to his view (1987a: 228ff.) that “philosophers who lose sight of the transcendence of reason [i.e., the universal-cognitive aspect of reason; NBT] become cultural (or historical) relativists”, viz., if one, like Putnam, understands this as a necessary consequence of ‘naturalization’. It was demonstrated above that this does not have to be the case. Whether Rorty and Foucault on the basis of the latter criterion can be considered to be ‘cultural relativists’, as Putnam maintains, is an issue that I am going to address below.

Putnam appears still to be making a point when suggesting a distinction between ‘relativism’, which he associates with ‘naturalization’ (for example, in the case of evolutionary epistemology or Rorty’s and Foucault’s “naturalist view inspired by the social sciences, including history”; Putnam 1987a: 229), on the one hand, and ‘relativity’, on the other. Whereas ‘relativism’, according to Putnam, leads to the elimination of ‘the normative’, that is, a functioning concept of truth (“a belief being justified or rationally acceptable”; ibid.: 222), ‘relativity’ is a natural consequence of man’s choosing between different conceptual schemes (Putnam 1987b: 17–20). However, in that case we are facing a logical incongruity: on the one hand, conceptual schemes as realizations of reason, according to Putnam, must imply both culture-dependent (‘immanent’) and culture-independent (‘transcendent’) cognitive features; on the other, he understands the choice of conceptual schemes as implying ‘relativity’. But if this choice can thus be dictated by culture-dependent distinctions, does it not then, following Putnam, imply ‘relativism’, as well? This incongruity can obviously be removed only if we assume that culture-dependent and culture-independent features interact in a hierarchically ordered process and that the concept of relativity therefore can and essentially must be applied to this as a whole – while the concept of ‘relativism’ then can be reserved for a one-sided application exclusively to one of these kinds of features (which, according to Putnam, should be the case in Rorty’s and Foucault’s models; see the discussion below). The degree of ‘relativity’ may now be assumed to decrease successively with an increasing degree of cultural dependence, but, as indicated above, not even logical constants can, due to their system-inherent ‘relativity’ (in a general sense of cultural learning) in principle be excluded from changes, although these would be extremely rare.
This hierarchical-processual understanding of ‘relativity’ of necessity brings with it consequences for the concept of truth. Since Putnam (and certainly Rorty and Foucault, as well) would agree that there is no absolute truth (a standpoint implied by the concept of relativity), the entire issue boils down to which criteria we consider relevant for justification or rational acceptability. Under these circumstances it appears inconceivable to exclude either biological or pragmatic/socio-cultural conditions, if proved to be relevant for our knowledge. It would be a matter rather of finding ways for their integration with overall reason and possibly clarifying to what extent they can be said to determine the latter.

On this interpretation ‘relativism’ can be avoided, but ‘the normative’ (truth) is subject to ‘relativity’ – to a higher or lower degree dependent on the place of the actual criteria in the hierarchy (from culture-dependent cognitive distinctions at one end to biopragmatically and logically founded, basically universal, cognitive distinctions at the other, respectively). According to this understanding, we cannot indeed exclude the possibility that something is accepted to be true in one culture but not in another. This conception is not due to ‘relativism’ (as maintained by Putnam; 1987a: 231) but rather a sign of respect for the fact that rationality (rational acceptability) can to a certain extent be culture-dependent. Therefore, it is not entirely convincing to blame, implicitly, ‘cultural relativists’ for opening the door to ‘cultural imperialism’, as Putnam (1987a: 232ff.) does. This door has been open all along since man became aware of his existence and relationship to the Other. To overcome one’s own individual – and, secondarily, collective – perspective by integrating the Other’s is an essential part of the ontogeny of human consciousness and knowledge, and of the historical accumulation of societal-cultural experience, respectively. Inclinations to cultural imperialism or, for that matter, racism and sexual discrimination, are system-bound and have to be overcome constantly.

Now, there appears to be another, and more serious, flaw in Putnam’s reasoning. When he (Putnam 1987b: 20) speaks of “our choice of concepts” and a corresponding plurality of ‘versions’, what does he mean by “our choice”? This is, I believe, a tacit abstraction likely to suggest that there can be an absolute collective choice as point of departure. I would rather say that every choice primarily is individual and dependent on the individual perspective, and only secondarily can – together with other individual choices or perspectives – form (be accommodated or reconciled in) a collective choice or perspective. Concepts or conceptual schemes may now be assumed to be collective only to the extent that they are cognitively-linguistically structured. Collectivism here is thus, as we can see, determined by ‘relativity’ in a further, more fundamental, sense than suggested by Putnam’s collective-restricted understanding or by its above application to culture-dependency vs. culture-independency, viz., as the outcome of the conditions of both discrepancy and inseparable interplay between the underlying cognitive-pragmatic system –
including accumulated experience and intention – of individual subjects, on the one hand, and the intersubjective cognitive-pragmatic system of the collective, communicable without residue by language (within the natural confines of polysemy), on the other. 'Intention' referred to above is understood to be implied by the overall concept of 'perspective' together with other presuppositions like emotions, values, beliefs, expectations, needs, desires, preferences, interests, ethical standpoints etc. Accumulated experience, or knowledge (in this restricted sense), can be understood to be either subjective or intersubjective. Perspective, however, primarily is subjective.

We appear to be able to share the same experiences, to know the same things, to agree on matters of fact; but don’t we overlook the fact then that our experiences, knowledge and agreements seldom present any complete match? Why is there something at all we call understanding? Is it not because there is still room for misunderstanding? Is it not because I can never be completely sure that I, in spite of language, know (perceive and cognize) the world exactly as you do? Is it not because what I appear to know is in reality an interpretation of the world from my perspective, or – on this basis – of your interpretation of the world from your perspective? This is, I would say, the most fundamental kind of 'relativity' in human knowledge, and it can, as far as I understand, be properly addressed only within a philosophical theory of perspectivism (see above; cf. Thelin 1990a: 19, 1999: 248; see 4.3, 4.6.3). In Putnam’s program there are no self-evident preconditions for integrating subjective perspective and knowledge with intersubjective knowledge and with the corresponding cognitive-pragmatic system structured by language. On the contrary, he would probably consider perspectivism to equal 'relativism' (if not solipsism). However, as I attempted to show, it could rather – if we use Putnam’s concept – be a matter of ‘relativity’ applied to the fundamental hierarchical-processual feedback relationship between subjective and intersubjective knowledge, embedded in the overall structure of a corresponding relationship of 'relativity' represented thus by the distinction between culture-dependent and culture-independent knowledge. These essential relations of intracultural and intercultural relativity, respectively, are actually indicated, without the necessary epistemological depth though, by Kuhn’s (1970: 4–5) conception of ‘arbitrariness’ as an "element compounded of personal and historical accident", of great significance, according to him, for the renewal of a predominating paradigm of research.

The question now arises whether subjective interpretations of the world are founded only on our different experiences of external conditions, according to a corresponding individual perspective with its various presuppositions, as, for example, of change-of-state and cause-effect conditions; or, whether they may be assumed to express in part also certain differences in our individual strategies of thought (and perception) in the same way as we may assume differences in our strategies of physical activity, including
speech. If such individual differences exist, and there is strong evidence that they do, it is obvious that they also – in agreement with the principle of hierarchical-processual feedback – must influence our interpretations of the world (exactly as ‘conceptual schemes’ do). We would, in other words, be dealing with an interaction between world and thought where the latter, besides (usually integrated with, we may assume) the perspectival interaction between subjective and intersubjective knowledge, contains in turn an interaction between, on the one hand, subjective strategies of thought, and on the other, intersubjective strategies of thought, suggested by language – and in part dictated by phylogenetic dispositions. Such an assumption would explain how there would be room for misunderstanding also in those cases where we ought to understand the Other’s perspective, viz., because the perspectival interaction is incapable of overcoming the discrepancy between the two kinds of strategies. Conversely, this assumption indicates that it is possible to overcome the latter discrepancy only by means of language and that understanding can thus be achieved at least to a degree that suffices for our needs, not only in practical life but also in science.

The interactive relation of ‘relativity’ that, accordingly, may be assumed to exist also between world/thought, on the one hand, and language, on the other, manifests itself in the latter’s neutralization of those discrepancies between the two that have not been overcome. The reason for this neutralization is the natural conformity of language which leads to a certain degree of ambiguity and scope for interpretation. This occurs in cases of subjectively-perspectival as well as subjectively-strategic discrepancies. Besides this fundamental, subjectively motivated, ambiguity language has its own, economically motivated (the principle of least effort), ambiguity in the form of systematic polysemy of linguistic expressions, uniting with and reinforcing the former kind of ambiguity. The two should not be confused, since polysemous expressions are not always used ambiguously, whereas subjectively motivated ambiguity is always realized by polysemous expressions (in a broad sense).

The idea to base – under the conditions assumed above – epistemology on a one-to-one relationship between language and reality, and postulate truth conditions on this basis, appears to lack prospects. Such a conclusion coincides with Putnam’s view, but in order to realize his ‘internal’ or ‘pragmatic’ realism we would, I maintain, need a hierarchical-processual model that broadens his concept of ‘relativity’ so as to include, in a theory of knowledge, above all the notion of perspective. The relative concept of truth, as sketched above, allows us, unlike Putnam, to accept the possibility of something being conceived as true in one culture, but not in another. We must, referring to the subjective perspective, also accept that within one and the same culture it is possible that something is true for one individual, but not for another. This is the indispensable, and evident, consequence of indi-
individuals’ cognizing the world in different ways, viz., according to subjective-perspectival as well as subjective-strategic idiosyncrasies.

It is no coincidence that Kuhn (see above) pointed to subjective (and historical) factors as the driving force in the process of knowledge. I believe that Putnam’s apprehensions regarding *metaphysical realism* as a consequence of considering bioevolutionary or socio-cultural (historical) factors can be dismissed, at least within the framework of their hierarchical relativization in a dialectical-processual feedback model. The same would thus apply to corresponding possible apprehensions regarding metaphysical realism (of the idealistic kind) as a consequence of the subjective perspective being integrated into the model of knowledge. Moreover, this would – in Putnam’s spirit – allow of a natural form of cognitive-pragmatic realism (abductive by function; see 3.2) that does not deny the existence of an external world but understands it as cognizable only in relative ways, that is, according to a dynamic system of intersubjective knowledge constantly interacting with the subjective perspective.

1.16 Subjectivity-intersubjectivity cooperation as a dilemma or a possibility: Davidson vs. Mead

These conditions were apparently the background for Donald Davidson’s (1984 [1974]) problems in accommodating ‘differences in belief’ within the notion of ‘conceptual scheme’ which he opposed as equivalent to ‘conceptual relativism’. Davidson’s problems were, I believe, caused by his inability to include in one coherent model of reality, language, and thought the distinction between subjective and intersubjective, that is shared, knowledge. More specifically, he presupposed infelicitously that the assumption of ‘difference of opinion’ or point of view as relevant to conceptual schemes necessarily implies ‘a neutral ground’, viz., in the absolute sense of ‘an uninterpreted reality’ or a corresponding ‘duality of reality and scheme’. Such implications, unacceptable to Davidson (and to me), can be avoided, however, in a coherent-abductive model in which subjective knowledge in a hierarchical-processual fashion constantly interacts with intersubjective knowledge, that is, if communicable (translatable) by way of cognitive-linguistic distinctions. Communication (understanding) is thus warranted only to the extent that such common distinctions enable knowledge to be shared, including underlying points of view. The separation of reality and ‘conceptual schemes’ (a notion we can indeed dispense with) is inconceivable in a theory of knowledge where, contrarily, in a *relationship of immanence*, cognitive-linguistic tools and strategies serve the interpretation of reality by constructing it hypothetically. The actual and relative adequacy of such construction of reality for our coping with it is apparently as
close to objectivity – or truth, for that matter – that we may come. This standpoint might be a feasible way to avoid in epistemological theory not only absolutism but also relativism (as distinguished from 'relativity' in Putnam’s sense; see the above discussion, 1.15), let alone solipsism.

The above reasoning appears to be more in line with Mead’s (1937: 89, 141; cf. Morris 1937: XIX, XXVIII) version of 'objective realism' and his corresponding attempt to interrelate 'common' and 'private experience' as determined by a relation between 'universality' and 'different perspectives', respectively. Meaning, according to Mead, arises in experience through reciprocal 'role-taking', including perspective. Mead’s attempt (1937: 89) is most interesting because it is one of few more elaborate reflections on the function of perspective in processes of knowledge, and more specifically, its relation to universality. On my interpretation of Mead’s proposals, universality here represents the meaning of an object of thought shared by the observers/speakers of a community, viz., "that which can be in different perspectives." The question now arises whether such a meaning should be thought to lack a perspective or represent a 'neutral perspective' (ideas rejected by me above as static abstractions). Neither alternative appears to be the case, because Mead goes on to define universality as "the identity which belongs to the different perspectives which are organized in the single perspective.” The sense is not self-evident, but an interpretation that – against the background of Mead’s understanding of meaning as the result of a 'co-operative process', using 'significant symbols' – suggests itself as likely is a hierarchical-integrative one. Accordingly, the structure of meaning can be understood to integrate hierarchically – according to perspective – levels of cognitive distinctions, shared by a community of observers/speakers, with levels of distinctions idiosyncratic to individual observers/speakers. ”The single perspective”, on this interpretation, is then in reality the compound ('co-operative') hierarchical structure of non-shared as well as shared perspectives. As a consequence of the assumed dynamic interaction between the latter it becomes imperative to make a further distinction, apparently not foreseen by Mead but crucial to communication and understanding. This is the distinction between non-shared perspectives penetrated by cognitive-linguistic means, on the one hand, and those not so penetrated, on the other. Understanding is warranted only in the former case. If this interpretation of Mead is correct it renders support for the above (1.5) assumption of subjectively caused incomplete specification of cognitive distinctions on lower hierarchical levels – and corresponding conditions of ambiguity or lack of understanding in those cases where these distinctions cannot be penetrated by linguistic means. These tentative observations might give the reader an idea of the nature of the issues to be addressed by future cognitive-perspectival research.
1.17 Rorty’s pragmatism: knowledge (truth) as a matter of justification through ‘social practices’, the dismissal of subjective perspective, and the lack of a cognitive-linguistic basis for intersubjectivity

Richard Rorty (1987 [1982]: 50-53) in a discussion of Nagel (1979) pays some attention to the problem of subjectivity or “the personal point of view”. However, Rorty’s version of pragmatism, which is based on a one-sidedly social approach to language (in accord with his view of “the community as source of epistemic authority”; Rorty 1979: 188), has no room for a functional distinction between subjective and intersubjective knowledge. His epistemology (a notion he would not use himself) is summarized (1979: 389) as follows: “If we see knowing not as having an essence, to be described by scientists or philosophers, but rather as a right, by current standards, to believe, then we are well on the way to see conversation as the ultimate context within which knowledge is to be understood. Our focus shifts from the relation between human beings and the objects of their inquiry to the relation between alternative standards of justification, and from there to the actual changes in those standards which make up intellectual history.” However important this aspect of knowledge is, it cannot alone explain how human beings can perceive and cognize the world and on this basis interact with each other in order to cope with it.

The integration of language in these processes is evident to everybody, but how can one imagine such integration in a model that on the whole neglects perception and cognition? Consistent pragmatism understands cognitive activities as equal to physical activities (or ‘social practices’). Eager to replace (‘capitalized’) Philosophy by a pragmatically founded “Post-Philosophical Culture”, Rorty throws the baby out with the bathwater. His essentially just criticism of traditional epistemology (represented primarily by transcendentalism and analytical positivism) turns into the untenable standpoint that knowledge is only a question of “social practices of justification”. The question suggests itself: by which means do these practices take place? Are we entitled to isolate language as social phenomenon (‘conversation’) from the perception and conceptualization of the world? It would have been possible not only to accept but also support Rorty’s pragmatic project, had it understood itself as an optional focus on socio-cultural and historical aspects of knowledge in a broad sense, but this apparently is not the case: “cultural anthropology is all we need” (Rorty 1979: 381). He thus generally rejects a systematic understanding of knowledge (ibid: 7). At the same time he after all inherits from analyticism an absolute understanding of language, viz., as more or less identical to thought (see 1.11).

Under these circumstances, Rorty (1987 [1982]: 50) sees subjectivity, due to its alleged irreconcilability with the intersubjectivity of language, as an
impasse. He asks himself whether we should blame "Philosophical ideas" (read: analyticism) for the condition that subjectivity appears to represent such an impasse with the resulting questioning of assumptions like "the solubility of philosophical problems", "the reach of language", and "our 'verificationist' impulses". Rorty’s answer is implicit but obvious: to him it is not consideration for subjectivity that justifies his rejection of analyticism and its assumptions, but the latter’s positivist-empiricist (mirror-like) treatment of the language-reality relationship. Rorty thus questions rightly "the reach of language" in its absolute (representational) relationship to reality, but captive to his static idea of a one-to-one relationship between thought and language he replaces this relationship by the relationship between language and 'social practices'. The latter relationship, to be sure, contains the necessary component of socio-cultural and historical relativity, but at the same time a high degree of absoluteness by leaving out not only the fundamental cognitive-linguistic preconditions for intersubjectivity but also the subjective-constructive perception and cognition of reality by individuals.

It is this absoluteness that, in my view, gives Putnam some ground for describing Rorty as 'cultural relativist', but I still consider it an exaggeration to see, as Quine does (in an interview), in Rorty’s ('non-capitalized') philosophy "destructive and nihilist tendencies". A more constructive interpretation of Rorty’s pragmatism, which after all professes Quine’s and Davidson’s holism (Rorty 1979: 170ff.; 1987 [1982]: 32, 40), would be to see it as a programmatic attempt to get rid of analytical philosophy and revitalize pragmatism as a more fertile alternative. Herein I would see Rorty’s great merit. On the other hand, we cannot be blind to the fact that this attempt at a truly paradigmatic renewal of epistemology represents a dialectical process with its own contradictions. One of these contradictions I find in Rorty’s recognition of the principle of holism, on the one hand, and the rejection of systematicity, on the other. In harmony with the former, Rorty (1987 [1982]: 28, 55) espouses the Sellarsian understanding of philosophy as "an attempt to see how things, in the broadest possible sense of the term, hang together" (Sellars 1963: 1; cf. also Rorty’s reference to Davidson’s 'coherentism'; p. 32). At the same time, apparently suggesting a one-sided foundationalist view of 'system', he denies the possibility of systematization of knowledge, when maintaining that "pragmatism denies the possibility of getting beyond the Sellarsian notion of 'seeing how things hang together'" (p. 55). When he then explicates this impossibility as "seeing how all the various vocabularies of all the various epochs and cultures hang together", we understand that Rorty has got stuck in this dialectical contradiction – and cannot overcome it – because of his isolating 'social practices' from the intersubjective preconditions of language and cognition for these 'practices', that is, for communication or interaction in a broad sense. What Rorty overlooks is that the latter is unthinkable without a system of invariant distinctions of a cognitive-linguistic nature. To the extent that these can be referred to phylogenetic
dispositions, we are entitled to speak of biopragmatic (including cognitive-linguistic) universals as preconditions for all kinds of human action: mental, physical, linguistic. However, dazzled by socio-cultural and historical variations, Rorty condemns the idea of universals (pp. 45f. 54). He appears unable to see that human knowledge is founded on a dynamic interplay between both invariant (including universal) and intersubjectively, interculturally and historically variant distinctions.

In this interplay, understood as a hierarchical-dialectical feedback process, the concept of invariance is not assigned any absolute, but certainly a systematic, function. In this light we understand better Rorty’s (ibid.: 52ff.) criticism of what he calls ‘intuitive realists’. Nagel (1979: 170), according to Rorty, thus essentially must appeal either to variance/subjectivity or invariance/universality as an explanation of his questioning “the reach of language”. With insightful reference to the “enormous amount of variation and complexity” that characterizes the relationship between language/thought and reality, Nagel chooses, and in my view rightly so, a combination of both, while Rorty rejects both since he, more specifically, does not consider subjectivity to be “something on which anything could throw further light. The claim is either deep or empty. The pragmatist sees it as empty […]”. In contrast to Rorty I consider attempts to solve the problem of interrelating subjectivity (the subjective perspective) and cognitive-linguistic intersubjectivity to be a 'deep' claim and probably the most indispensable in today’s epistemology. This claim is highly consistent with the semiotic-processual understanding of pragmatism advocated here and contradicts, as demonstrated above, the absolute assumptions by Rorty (ibid.: 52ff.) that “our knowledge is limited by the language we speak” and “the appeal to non-linguistic knowledge in philosophical argument [is] a dialectical impasse [and] mark of bad language.”

From a linguist’s point of view there is no need to see the revitalization of pragmatism as the end of philosophy for the reason that the latter to a great extent was dominated by transcendentalism or analytical positivism. The shifts of paradigms can be viewed as a natural expression of the role of philosophy as ‘mediating interpreter’ of the particular sciences’ (implicit) models of knowledge and the continuous change of methods as a consequence of new knowledge. To understand this process exclusively as a shift of ‘vocabularies’ in our discourses about reality implies a denial of the factual renewal of knowledge. We may criticize the Enlightenment and positivism for their absolute suppression of ‘prejudices’, or rather the role of the subjective perspective, in this interpretative process, but we cannot deny the possibility of such renewal. Rorty’s idea of the exclusive change of ‘vocabularies’ overlooks the condition that new knowledge (in a non-cumulative sense) is an immanent precondition for the change of knowledge. This merely apparent paradox is explained by the condition that renewal of knowledge is not just a question of change in language (conversation or text) but also of the
integrative relation of this language to our thought and changing picture of the world. Such a relative understanding of knowledge is coupled with the idea of essentially changeable rationality, implied by the content of cognitive-linguistic (along with socio-cultural and historical, to be sure) intersubjectivity in dynamic interaction with the subjective perspective as the primary source of every human observation and discovery – and consequently – of new knowledge (cf. Thelin 1990a: 19, 1999: 248, 251). One might say that intersubjective knowledge represents both a certain constancy (manifested by ‘social practices’ at a given historical moment) and at the same time sensitivity to new subjective knowledge. This is actually, in essence, an overall application of the classical linguistic relationship of diachrony and synchrony – and the necessity of unifying both at a given historical moment of interaction.

Knowledge – and truth – are thus not only a matter of justification through ‘social practices’ but also, and most essentially so, a matter of individual experience, interpretation and choice, determined by the interplay of phylogenetic (biological) and ontogenetic (socio-cultural) factors. Pragmatism, accordingly, should pay attention to both kinds of factors (and their consequences). Such, I would imagine, is the basis for human rationality, immanent in the coherent abductive-processual feedback relationship between our perception of the world, on the one hand, and our activities (interactivities) to cope with it, on the other, that is, physical, cognitive and linguistic action. Because of its embeddedness in the interaction between the subjective perspective and cognitive-linguistic intersubjectivity, rationality, in the form of thought or language, cannot therefore be absolute or, as Rorty rightly maintained – although only with reference to intersubjective, that is, socio-cultural and historical differences – function as a “mirror of nature”.

Michel Foucault’s (1987: 95–124) decomposition of rationality (i.e., the rationality of self-evidence) into a ‘polymorphism’ of events or ‘elements that are brought into relation’ is obviously restricted by his corresponding focus on historically-politically defined ‘regimes of practices’ as the power-structured basis for ‘the production of true and false’. Whether this can be viewed as ‘cultural relativism’, as maintained by Putnam (see above, 1.15), is probably a matter of preference. Like Rorty’s version of pragmatism, Foucault’s cultural perspective, in particular his hierarchical-processual understanding of ‘eventalization’ (see esp. p. 105), certainly may contribute to a holistic model that seriously posits the question of a dynamic interplay between subjective and intersubjective (socio-cultural) knowledge.
1.18 Toward an integration of subjective and intersubjective knowledge in coherent models of hierarchical-processual (circular) interdependence

Against this background it was most promising when Bill Brewer (1999) in a more dynamic perspective than traditionally was the case raised the question about the relationship between perception and reality, and did so in a fashion that includes the subject’s point of view as part of the cognitive contents of rationality (ibid.: XVIff., 19, 122, 129ff., 151ff., 217, 222ff.). This recognition of the epistemological role of the subjective perspective (and rejection of corresponding ‘second-order knowledge’ that Brewer saw not only in classical foundational models but also in Sellar’s coherentist model; pp. 130, 137) ought to have far-reaching consequences for our understanding of human knowledge. Therefore, it is remarkable that Brewer’s model takes its departure from the pronouncedly foundational thesis that “perceptual experiences provide reasons for empirical beliefs” (p. 18). Even in the light of the subject’s point of view and “other relevant circumstances of perception”, including “direction and focus of […] attention to the relevant portion of the world”, “current projects, both practical and theoretical”, and “certain goals in action”, Brewer sticks to the possibility of isolating perceptual experience as “sufficient to provide [a person] with a reason to endorse it in belief, which […] is sufficient in turn to constitute such a belief as a piece of knowledge” (ibid.: 217ff, 222ff.). This is, in my view, an infelicitous abstraction, parallel to Brewer’s ‘external’ understanding of an absolute “mind-independent spatial world”, that is, without a differentiation between ‘know that’ and ‘know how’ that threatens to obscure the complete and constitutive interaction (by feedback) between perception and rationality (also in cases where perceptual experiences are judged not to make sense), and thus demonstrates the limitations of Brewer’s attempt at “a far more integrated approach” (ibid.: XVIIff.).

Such interaction can, in my understanding, be accounted for only in a truly coherent model of the hierarchical-processual type with a pivotal feedback mechanism. Brewer’s ‘coherentism’ essentially confines itself to the per se important question how the perceptual contents of the subject are to be integrated in ”a whole system of related such contents”. Besides, it does not become clear that in the latter case one is obviously concerned with a global system of interacting distinctions, perceptual as well as cognitive-linguistic, characterized in turn by universality (to a successively and hierarchically decreasing degree) as well as culture-dependence/conventionality (to a successively and hierarchically increasing degree). Apart from the need for this broader perspective, Brewer deserves full recognition for his insight that the integration, or rather interaction, of subjectivity and intersubjectivity of necessity ascribes to epistemology a kind of “cognitive dynamics” for which he
also finds support from researchers like Kaplan, Evans and Cassam. However, it is difficult to accept his (ibid.: 221) attempt to reconcile in one model foundationalism and coherentism. Coherentism – at least in a holistic, hierarchical-abductive sense – denies the possibility of a foundation or privileged point of departure for the process of knowledge. It can in principle commence at any phase of the continuous circular feedback movement of analysis-synthesis. This understanding of coherentism is obviously closer to that embraced by Laurence BonJour (1985: 89, 91, 93–101, 153–156). Brewer’s (1999: 141ff.) still predominantly foundationalist, and after all in part static, understanding of knowledge is manifested by his difficulties to accept in BonJour’s model (e.g., p. 92) “circular interdependence” as ‘good circularity’, that is, as a natural consequence of permanent feedback and coherence ‘in the long run’ (p. 153). In contrast to Brewer (1999: 142) I consider (and demonstrate below) that a corresponding abductive treatment of the process of knowledge is reconcilable also with the coherentist view. Finally, as Brewer (p. 144) admits himself, only such a long-term understanding of coherence can be adequately embedded in a biological-evolutionary model of the development of ‘cognitive beings’.

It is thus noteworthy that BonJour (1985: 101–106) made an attempt to account for the distinction between subjective knowledge (“one’s own system of beliefs”) and intersubjective knowledge (viz., as epistemically justified empirical beliefs) by including in his coherence theory a so-called Doxastic Presumption. The latter was conceived by him (p. 104) as a ”basic and unavoidable feature of cognitive practice. Epistemic reflection, according to [a coherence theory], begins from such a (perhaps tacit) representation of myself as having (approximately) such and such a specific system of beliefs: only relative to such a representation can questions of justification be meaningfully raised and answered [my emphasis]”. BonJour’s integrative view of the hierarchical order implied becomes clear from his statement (p. 104) that ”the epistemic justification of an empirical belief derives entirely from its coherence with the believer’s overall system of empirical beliefs.” These insights (present, in essence, already in Cartesian and Humean thought) are very much in line with my own understanding of the subjective perspective, in a broad sense, and the view (Thelin 1999: 303) that ”the great challenge […] facing cognitive-pragmatic science […] is the task of integrating a theory of perspective […] into functional semiotics and a corresponding theory of knowledge.” It remains an open question though to what extent BonJour’s Doxastic Presumption can be implemented in a future coherent model of reality, language, and thought in ways that satisfy not only the demand for ‘good circularity’ but also for a mechanism of thorough-going feedback, open to a constant input of sensory experience, memory and imagination. The satisfaction of these very claims certainly remains to be demonstrated also in regard to the holistic, coherent-abductive model presented below rather as a methodological program. It is to be hoped, however, that the par-
ticular "theoretical fragment" explored, viz., the processes of human perception and conceptualization of events in terms of a temporal, specifically aspectual, perspective, shall favour the novel orientation of epistemology suggested here from the empirical standpoint of biopragmatic and linguistic universality.

1.19 The philosophy of language and cognition, and the programmatic basis of Artificial Intelligence and cognitive science: interrelated developments

The above first outline of a biopragmatic approach to language, thought and reality is presented from the viewpoint of a linguist and reflects the ambition to found this approach on a critical discussion of the philosophical tradition. Although indicated so far merely indirectly, there are in the preceding account striking parallels to the developments in Artificial Intelligence (AI) and cognitive science which cannot have evaded the reader familiar with or engaged in these disciplines. In order to enable an understanding for how the present theoretical framework and its underlying methodological assumptions of holism-coherentism, hierarchy, process, distinctive features, and circular feedback, might hopefully be integrated to some extent in computational models, specifically perhaps, for developing AI programs for temporal processing, I would like to present in the following an overview of the most significant interrelated developments as I understand them.

To an observer not engaged directly in the practices of AI and cognitive science it appears that the emergence of these disciplines (along with the need for computational application) was intimately connected with the same striving for scientific objectivity in the exploration of human language and thought that gave rise to philosophical analyticism. If, somewhat simplified, analytical positivism pretended that we can learn how language and thought relate to the world by saying what makes sentences true, the corresponding assumption underlying classical AI and cognitive science (usually dissociating itself from the experimental tradition of cognitive psychology) was that this relation could be accounted for by a system of encoded symbols manipulated and operated upon by a computer program. The kind of representation assumed by this mode of procedure was challenged by Winograd and Flores (1986: 23–37) who maintained "that we need to replace [this] rationalistic orientation if we want to understand human thought, language, and action, or to design effective computer tools" (p. 26).

Winograd and Flores advanced an alternative to the rationalistic (positivist) view of the mind-world relationship based on activities of interpretation. Proceeding from Heidegger’s idea of 'thrownness' (Geworfenheit), which precludes the separation of subject and object, as well as Heidegger-
Gadamer’s *hermeneutic circle*, they proposed instead the hypothesis of *mind-world interaction* developed by me above (esp. 1.2, 1.5–1.7, 1.9, 1.15–1.18) as a precondition for the *coherence* of hierarchical processing and, in particular, the functioning of ubiquitous *perspective* (and corresponding ordered sequences of selection/decision-making; see Ch. 3).

The idea of ‘interactivism’ was convincingly corroborated further by Bickhard and Terveen (1995: 1–17) who suggested the notion of ‘encodingism’ to capture the lack of logical coherence in symbolic representations fulfilling the role of *mind-world correspondences*. It is obvious that the latter idea is parallel to the philosophical correspondence theory of truth treated above as outdated in cognitive-pragmatic analyses of reality and truth (see 1.2, 1.9). Bickhard and Terveen also suggest “the necessity of an interpreter” (p. 17) and point (p. 12ff.), most importantly, to the inevitable problem of circularity caused by a representation that presupposes what it is meant to explain. This reminds us of the distinction made above (Preface; 1.5–1.7, 1.12, 1.18; see also 2.4) between vicious circularity, on the one hand, and ‘good circularity’ as constitutive of interpretation by way of hierarchical-processual feedback (the hermeneutic circle), on the other. As further pointed out by the two scholars (p. 17), interpretation cannot take place without an *intentional agent*. In a corresponding way, *teleology* is a fundamental feature of the biologically founded cognitive-pragmatic framework proposed in this book (see, for example, 3.1, 3.9). In giving general support to Bickhard and Terveen’s developed theory of ‘interactivism’, I consider it important to emphasize that interaction, according to the present model, including perspective as an essential constituent, would take place not only between subjects and objects (mind-world), but also between (individual) subjects.

The ideas of Winograd and Flores (1986) can thus apparently be said to have laid the foundation for a new orientation of AI and cognitive science from static symbolic representations, logical incoherence and vicious circularity toward dynamic forms of representation, logically coherent processes and ‘good’, interpretative circularity (feedback). As part of this – I would say, paradigmatic – change and, in particular, their hermeneutic approach, they are also not far from revealing the systematic role played in cognitive processing by *perspective*. In this direction they furnish arguments (ibid.: 115) from the interpretation of new inputs understood not as *problem solving* but as *pattern recognition* guided by previously existing structures (see 3.2, 3.8, 3.16). These assumptions are very much in line with those presented in this book, as is their corresponding conclusion from Heidegger’s ‘thrownness’ view of the mind-world relationship: “There is no neutral viewpoint from which we can see our beliefs as things, since we always operate within the framework they provide” (p. 32). Compare in this connection my critical discussion of Searle in 1.9.
Another remarkable thing about Winograd and Flores’ ground breaking book is that it, very much in harmony with the present proposals (see Ch. 2–3), suggests endeavours to found our understanding of language and cognition, as well as the corresponding design of computers, on the evolution of biological processes (more specifically, as these were conceived in the works of Humberto Maturana; ibid.: 38–53). This general standpoint was of course the basis for Merlin Donald’s (1991: 1–9, 365ff.) fundamental critique of AI and cognitive science.

It should be noticed that the danger of ‘linguistic idealism’ correctly observed by Bickhard and Terveen (1995: 44-46) as inherent to classical hermeneutics, restricted to interpretation as “ontologically constituted in terms of historically situated language” (p. 45), does not pertain to the present, cognitive-linguistic understanding of interpretation and circularity as constitutive of truly interactive processes. This will be demonstrated below in the abductive-regulative overall model of cognition and action (including linguistic action) cooperating with perception (see 3.2).

Whereas Bickhard and Terveen (p. 43) along with symbolism reject also connectionism as an alternative programme for AI and cognitive science because of the neglect of environmental interaction they both demonstrate, Gärdenfors (2000: 1) argues that “they should rather be seen as complementary methodologies.” In the light of the present abductive-coherent feedback model I am inclined to support the standpoint taken by Bickhard and Terveen. A more sanguine assessment of the potentials of connectionism, however, was presented in Donald (1991: 366ff.).

Gärdenfors (personal communication) admits that his suggestion to distinguish three methodological levels, where his ‘conceptual level’ bridges between the ‘symbolic level’ and the ‘connectionist level’, is due to a simplifying idealization in need of a future elaboration within more dynamic models (see 1.3). It is noteworthy that he also concedes that his narrow understanding of symbols (pointed out by me in the section just referred to) may be caused by a “too strong influence of AI”. These frank statements by a prominent representative of cognitive science appear to indicate that the practice of this discipline and its relations of reciprocal relevance and adequacy to AI are still in a considerable methodological flux, apparently far from implementing the programmatic principles proposed already by Winograd and Flores and later by Bickhard and Terveen – and in most respects confirmed by the present philosophical-pragmatic and cognitive-linguistic framework.

1.20 Summary

The above outline of the general philosophical background for temporal research centres, according to the chosen biopragmatic perspective, on the
dynamic relationship between subjectivity and cognitive-linguistic intersubjectivity. The latter relationship is understood to be crucial to a theory of knowledge encompassing also processes of perception and action. The subjective perspective is thus established as an indispensable point of departure, not only in harmony with the genuinely perspectival nature of time, derived from space, and made explicit by the temporal category of aspect (still presenting a tangible spatial cognitive-semantic component), but also, more generally, as the very foundation for man’s perceiving, cognizing, and acting upon the world, viz., in a complex, hierarchical process of coherent interaction within and between subjects, as well as between subjects and objects, on the basis of cognitive-linguistic intersubjectivity. This orientation of biopragmatism associates it closely with philosophical perspectivism.

In the light of the traditional, inconclusive controversies between idealists and realists, as well as rationalists and empiricists, the attempt is further undertaken here to examine, alternatively, to what extent models of hierarchical processing in the human mind and its interaction with the experienced world can be said to find support in previous philosophical thought, and, possibly, to overcome these controversies. Kant within his ‘critical idealism’ actually opens up the possibility of the formation of concepts on an empirical basis, presupposing tacitly a corresponding dynamic interaction with reality, and thus taking the first steps toward an experiential as well as cognitive realism. His a priori treatment of space and time is contrasted by observations of these categories in unambiguously pragmatic-constructive terms. The real breakthrough in the development toward a hierarchical-processual understanding of human thought was represented by Hegel’s dialectical movement and its anticipation of the crucial function of circular feedback in the permanent process of analysis-synthesis. The latter function was made explicit by Gadamer’s philosophy of hermeneutics. It is suggested that Hegel’s integration of subject reality and object reality within his dialectical movement be interpreted as in effect making the distinction idealism vs. realism more or less irrelevant. The dissolution, at least, of the absolute and adverse nature of this distinction, as well as of the distinction rationalism vs. empiricism, is in fact one of the consequences to be hoped for from the abductive overall model proposed below (3.2).

The present, empirically based linguistic approach to time and space, encompassing (in ways to be demonstrated further) processes of perception, cognition, and action, transcends (and questions generally) the positivist approach to language as an isolated logical system in the practice of analytical philosophy. More adequate hypotheses – than are truth conditions – about the mind-world relationship, thus reflecting conditions of interaction, hierarchy, process, coherence and feedback, are shown to be derivable from, most importantly, the kind of pragmatically based semiotics advanced by Peirce (including his central concept of abduction) and Gadamer’s hermeneutics, but also, in part, from Mead’s and Popper’s considerations of per-
spective, Habermas’ New Paradigm, Putnam’s ‘pragmatic realism’; with
certain reservations, Rorty’s pragmatism, as well as definite developments
still within analytical philosophy. Constructive implications in the latter
case, especially in regard to cognitive hierarchization and mind-world inter-
action, are shown to inhere in, for example, Zinkernagel’s revision of phi-
losophy of language and Quine’s holism. Important contributions, reconcila-
ble essentially with the abductive model, to conditions of coherence, includ-
ing, in part, processes of perception, subjective perspective, as well as the
distinction between subjective and intersubjective knowledge, are found in
Brewer and BonJour.
2 Space and time cognition from an evolutionary point of view

2.1 Interrelations of spatial and temporal perspective in the light of biological, societal, and linguistic evolution

As soon as human beings began to reflect upon matters of existence they were bound, sooner or later, to stumble on the issue of time. At a certain stage of biopragmatic and cognitive-linguistic evolution they must have realized that their observations of the surrounding world and themselves were unthinkable without a perspective on things and events that determined their place in space and time. Time turned out to be the faithful companion of motion and change. It could be the regular changes of day and night, of the year, of life, or irregular courses of events in various everyday situations. Along with space, time stood out as a central and indispensable part of man’s picture of the world.

In this capacity, time through history has aroused the curiosity of thinkers and scholars. Countless attempts have been made to explore its innermost essence, but the picture created by the various hypotheses brought forward is highly ambiguous. The concept of time, therefore, in many people’s eyes has remained an enigma. The two disciplines that have traditionally paid most attention to this issue, philosophy and physics, have not come to a general agreement about the essence of time. This, I maintain, is a consequence of the basic condition that both, in their own way, have demonstrated a pronouncedly static understanding of the nature of human knowledge. Theories of time in this tradition can hardly be reconciled with those cognitive processes which, in the light of biological, societal and linguistic evolution, may be assumed to condition man’s perception of the world.

The growth of hypotheses about such cognitive processes (to be discussed below) makes it likely that an incisive study of the human concept of time can take place only in an intimate, processual connection with the human concept of space. The question of their mutual hierarchy therefore becomes central to theories about the cognitive essence of time – not only in a synchronic perspective, represented by the cognition of adult individuals at a specific historical moment; such theories cannot, apparently, without contradiction be formulated without considering also the diachrony of the two, that is, our hypotheses about their mutual order in the evolution of the species.
(phylogeny), i.e., in terms of general dispositions, as well as in the development of the individual human being (ontogeny). Accordingly, knowledge about the phylogeny and ontogeny of the central nervous system stands out as most significant for our hypotheses about the cognition of space and time – to the extent that the latter in the future may be correlated to corresponding processes in the brain.

In accord with these assumptions, language – as the natural companion and hastener of human cognitive development – takes on a key role as the researcher’s only direct access to those empirical data which reflect the thought structures of time. *If physical theories of time generally ignored language* (Niels Bohr was a striking exception; see 3.12), *and philosophical theories of time to this day have paid it merely superficial attention, it is reasonable that a new, linguistically based, philosophy of time would seize upon precisely the various expressions of time in language and study their underlying cognitive-semantic distinctions, as well as the development of the latter as reflected by the process of socialization and language acquisition.*

The fundamental insight into the relational and essentially perspectival functions of time gained by cognitive semantics from the temporal categories of language (aspect, tense, taxis) indicates that human temporal distinctions primarily represent processes of thought associated with the perception of motion. Temporal distinctions are thus, in particular when realized by the superordinate category of *aspect*, part of the crucial analysis of change-of-state, indispensable to the maintenance of human life. *Due to its significance for the interpretation of change and cause-effect, time is indeed a precondition for man’s adaptation to new situations* (see 3.9–10, 3.13).

As an expression of processes of thought, indispensable to the maintenance of life, time presents itself as a natural object of exploration within an epistemological framework inspired, most importantly, by a biological theory of evolution and, intimately coupled with it, the philosophical principles of pragmatism and perspectivism.

Ideas of the American pragmatic school, in particular Charles S. Peirce’s semiotic thought, have thus in recent years – and to an extent that could not be foreseen even by Roman Jakobson, the influential introducer of Peircean philosophy in linguistics – come to stand out as an invaluable guidance to the novel cognitive-pragmatic orientation of linguistic semantics. The theoretical understanding of *aspect* (and time, in general) evidenced by the present work is founded on a construction that harmonizes well with Peirce’s central hierarchy of *universal categories* (see 4.7). Observations by Peirce, but also by William James, of *the cognition of continuity and succession* are, as we shall see below, further significant contributions to the historical development of the philosophy of time.

Assumptions about the relational nature of temporal distinctions, and especially the superordinate role of the category of aspect, give new support, in particular, to the traditionally neglected philosophy of *perspectivism* and its
logically implicit appeal to \textit{variation} and \textit{selection} as pivotal conditions not only for linguistic, but also for an underlying biological and cognitive-pragmatic functionality.

The decisive role of space and time cognition in human survival is beyond all doubt. A linguistically based philosophy of time cannot therefore adequately formulate its hypotheses without considering the experiences accumulated in regard to the biological evolution of knowledge. It is not by coincidence that one of the leading representatives of this scientific discipline, Konrad Lorenz, paid attention also to space and time cognition in the human species. After a few introductory remarks I am going to examine below his interpretation of the unique position of these categories in the human species, and in the human picture of the world. From the latter point of view of special interest is how he relates Kant’s a priori conception of space and time to his own evolutionary position.

In view of the polarization of the scientific (physical) and the humanistic exploration of the concept of time as established historically, it would appear reasonable to pay attention to the reconciling role that actually might be played by biologically founded comparative ethology. In his "Russian Manuscript" (1944–1948; cf. Lorenz 1996: XXXI, 12), Lorenz thus understood such research as a possible link between the natural sciences and the humanities. He maintained that the natural sciences, by studying man and especially the human nervous system, would learn to regard experience and knowledge as organic functions, and thus engage the humanities in their own core field.

Such an understanding in reality also underlines the relevance of a historical-genetic dimension – to a significantly greater extent than was the case in traditional philosophy, psychology, and linguistic semantics. It also legitimates endeavours within these disciplines to correlate their epistemologically founded models with accessible data about the evolution and functioning of the human brain.

In this light, knowledge about the space and time orientation of the organisms, in particular from the perspective of evolution from simple to more complex species, stands out as most relevant to general theories of space and time. Equally, it might be important for the latter to integrate knowledge about which parts of the human brain interact in space and time orientation (and about their relative age) in order to assess hypotheses about the cognitive-genetic development of space and time – both in relation to other organic functions and to the distinction between space and time cognition, respectively. It would thus appear meaningful to examine whether neuroscientific data verify the hypothesis suggested below, viz., that time orientation is a cognitive function of a complex nature derived by a coherent process from the relatively simpler, and earlier, space orientation.

A corresponding evolutionary view was, actually, brought forward already by Jean-Marie Guyau (1902 [1890]; cf. Whitrow 1980: 51ff.), al-
though without a foundation in any explicit and coherent process of cognitive derivation of time from space. Aware, apparently, only of tense distinctions, Guyau sees the origin of time rather in man’s spatial perspective on what is before him and its transformation into the temporal perspective toward the future. Such a hypothesis is not supported by an aspectually founded analysis of temporal distinctions, since the latter regards temporal ordering – and this is what tense is about, viz., from the standpoint of moment of speech (observation) – of events as dependent on aspectual analysis. Tense distinctions, accordingly, would apply only to an order of events established already by aspectual analysis in intimate cooperation with change-of-state and cause-effect analysis. The derivation of time from space would, as demonstrated in detail below (3.16), be manifested thus in more evident – and apparently more fundamental – ways by the aspectual, that is, compound spatial/temporal, distinctions: (a) the situational-perspectival foreground-background (general ’close-remote’) distinction, and (b) the event-perspectival totality-partiality distinction. More specifically, this derivation would be manifested by (c) the hierarchically superordinate analysis of motion, and coupled with it, the reinterpretation of changing spatial distance in (temporal) terms of old and new states (i.e., in terms of ’before-after’ or succession, not yet subjected to tense differentiation). Of the procedure (c) – and this is important – the aspectual distinctions (a) and (b) are assumed necessarily to partake by way of processual feedback. These new proposals should not in the slightest overshadow the advanced, pronouncedly constructive view of time cognition on which Guyau based his fair criticism of Kant’s a priori conception; nor should they preclude spatial distinctions as also being at the origin of tense (see 4.6.4.2: Excursus III; see also Ch. 7 and 11.2.3, 11.2.17). This constructive view was adopted also by Whitrow (1980: 64, 74) with regard to time, but not to space, which according to him is ”automatically part of our experience”. Similar to Guyau, Whitrow did not apparently discern the deeper hierarchical-processual relationship of cognitive coherence between the two. Nor did he realize the truly constructive role of time as means of the perspectival analysis of events, as evidenced by his view that time ”is produced by the events”.

Under the conditions thus outlined, it would, in other words, be possible in principle to found a model of human time cognition within a greater biological whole where the assumed hierarchical-processual relations between space and time in the synchronic model, as indicated above, would be consistent with our knowledge about their diachronic properties, that is, both their species-specific (phylogenetic) origin and their individual (ontogenetic) development (based on cognitive-linguistic intersubjectivity). Accordingly, the important question arises whether and to what extent the two categories of space and time can be said to be inherited or acquired. Studies of the acquisition of space and time orientation by the child – before and during the
acquisition of language – may therefore be ascribed a significant role for our hypotheses about the cognitive status of temporal distinctions.

Having this in mind, it appears more than well-founded to assume that language and linguistic analysis are significant for the study of time as an epistemological problem. From a theoretical point of view the ontogeny of language may be assigned a position equal to that of its social-cognitive ‘phylogeny’. In such a way we project also onto historical linguistics – traditionally restricted mainly to phonology, morphology, and to some extent syntax – the further component of research, viz., *diachronic semantics* as the study of the cognitive-semantic evolution of linguistic communities (reflected merely superficially by, for example, lexically dictated etymological studies). The ‘phylogeny’ of language (i.e., in this social-cognitive sense; see 3.16) may now in a natural way be differentiated by being related to the cognitive evolution as represented, on the one hand, by the entire human species (with identical cognitive capacities) and the corresponding universal linguistic evolution; on the other hand, by subclasses of the species (with distinctive developments on the basis of the identical cognitive capacities), determined by socio-cultural and linguistic kinship relations, and corresponding typological and language-specific developments, respectively. A question our discussion has to address is which cognitive status – within this hierarchical framework – should be ascribed to space cognition and time cognition, respectively, and whether different types of temporal distinctions represent a different cognitive status (see 2.2).

The condition that the cognitive-genetic view of language would give birth to a diachronic semantics is a striking parallel, actually, to the circumstance that the practice of generative grammar (syntax) in the second half of the 20th century, in spite of everything, had the positive effect of provoking the forceful development of a synchronic – more specifically, cognitive – semantics. Linguistics at the outset of the 21st century is thus in a position finally to overcome Ferdinand de Saussure’s rigid distinction between synchrony and diachrony and profit from knowledge about the naturally equivalent hierarchical-processual structure of the phylogeny, ontogeny and synchrony of language.

**2.2 Implications of Lorenz’s phylogenetic interpretation of Kantian a priori: a critical discussion**

Lorenz (1996: XXXff.) originally conceived of his ‘phylogenetic theory of knowledge’ as founded on some kind of dialectical materialism. Later he (Lorenz: 1973) appeared to modify his philosophical standpoint by assuming a moderate kind of realism which he (in accord with Campbell 1974) understood as ‘hypothetical realism’ (see the discussion in 1.2). This development
was evidenced by the fact that his earlier, fundamental criticism of idealism – especially in regard to Kant – was now given a new, constructive-dynamic interpretation. Like Popper (1959: 453, 456) he thus moved closer toward Kant’s *unknowability* of ‘the thing in itself’, but did so only to the extent and in the sense that knowledge could be regarded as the result of an interaction between ‘the thing in itself’ and the human perception apparatus.

It can actually be discussed whether Popper ever finally accepted Kant’s thesis of unknowability. One might as well understand his standpoint rather as an attempt to relativize the *knowability* of ‘the thing in itself’. It is interesting that in that case he may be understood to have done so by ascribing to the perception apparatus a *pronouncedly perspectival dimension*: “[…] the appearances result from a kind of interaction between the things in themselves and ourselves. This is why one thing may appear to us in different forms, according to our different ways of perceiving it [my emphasis] – of observing it, and of interacting with it. We try to catch, as it were, the thing in itself, but we never succeed: we only find appearances in our traps.”

Lorenz, however, accepts Kant’s a priori categories of space and time, although he does so not as an expression of Kant’s idealist conception of absolutely given innate forms of apprehension that are independent of all experience but rather as an expression of the phylogenetic-empirical conception of these as the inherited result of adaptation and evolution originating in sensory data. Such an understanding, as we shall see, makes it likely, indeed, that the categories of space and time will be represented by equivalent processes also in the ontogeny and functional synchrony of cognition – a condition Lorenz apparently was not aware of. If this is the case, it is theoretically possible that not only the category of time but also the category of space may be derived system-inherently and that Kant’s corresponding a priori categories will thus turn out to be superfluous. This does not exclude the possibility that these processes are based on certain innate strategies of perception and cognition. A more specific expression of these strategies might hypothetically be the ’a priori’ apprehension of *things* along with their *extension* and, on this basis, their rhythmically based *divisible continuity*, viz., as precondition for the ’a posteriori’ apprehension of both space and time. My assumption is thus that the system-inherent derivation of space and time in a coherent hierarchical process basically will make the Kantian distinction dispensable.

A biologically founded framework for theories of knowledge and science appears to enable an exploration of human language and thought that reconciles empirical and rational factors in dynamic ways. Equally, it offers an integrated understanding of the subject-object relationship. Reality is presupposed, to be sure, but is regarded as knowable only to the extent that the human species for its survival has developed means for its perception. In perception, experience and reason meet in the form of sensory data and cognition, respectively. Their dynamic interplay is demonstrated roughly by the
dependence of reason on (the amount and kind of) experience, and conversely, of experience on (the relative nature of) reason. Reason cannot be absolute, since it is subject to emotions (cf. Damasio 1994), values, preferences, expectations, intentions and corresponding actions. Therefore, acts of perception always represent interpretations of sensory data that are rational from the specific perspective determined by sensory as well as individual emotional and cognitive-pragmatic conditions.

We are thus concerned with a moderate kind of realism that Campbell and Lorenz with quite good reason called 'hypothetical'. However, it should be noted that the hypothetical nature of this realism must be understood to reflect the essential condition that perceptual experiences ('phenomena') always represent reality from the viewpoint of individual hypotheses or interpretations. Furthermore, this essentially hermeneutic and (in a phenomenological sense) 'experiential' realism would, as indicated above, be assumed to embed knowledge – as synchronic entity – in a constant process of diachronic, that is, ontogenetic and phylogenetic, interplay. On the assumption of the essential role of perspectival functions in the concept of knowledge, I previously characterized this philosophical standpoint as 'experiential-perspectival realism' (Thelin 1999: 299; see 4.8) and found some support for it in Putnam's (1981) 'internalist view'.

Genuinely idealistic conceptions would then in principle deserve to be maintained merely to the extent that a theory of knowledge is unable to derive (hypothetically) fundamental cognitive structures from the phylogeny or ontogeny of man. Corresponding 'a priori' or ad hoc 'ideas' would, however, in a moderately realist philosophy rather be understood as indications of the current limits of knowability. In contrast to 'foundational' or 'metaphysical' realism, such a philosophy accepts these limits as evidence of our incapability of ever achieving full knowledge.

In the light of these preliminary observations let us now consider Lorenz's attempt to reconcile Kant's a priori understanding of space and time with his evolutionary theory of knowledge. According to Lorenz (1996: 16, 18), it is natural that the innate structure of the sensory organs may also include definite 'a priori' forms of possible perception. Thus he declares that "modern perceptual physiology and psychology have revealed extremely complex but nevertheless apparently entirely reflexive processes in the central nervous system that construct from sensory data perception of space, form and size with respect to objects [my emphasis]." Lorenz thereby appears to restrict Kant's general a priori understanding of space to things, emphasizing at the same time his biological perspective: "These processes [...] provide the precondition for and [...] the phylogenetic precursors of our interpretation of spatial relationships."

Lorenz's interpretation is still consistent with my hypothesis of space as essentially a construction 'a posteriori', and a correspondingly restricted relevance of the Kantian a priori concept for ontogeny (cf. Thelin 1999:}
The question is to what extent this construction is inherited in spatial terms (as Lorenz appears to assume when speaking of "phylogenetic precursors") or is founded on innate cognitive capacities of a more general nature, possibly together with a fundamental, 'a priori' apprehension of things, including their extension and divisible continuity (cf. Piaget 1937: 11–96). The latter alternative is what I rather tend to favour. This would to a still higher degree pertain to time orientation, which is more complex than space orientation, and consequently can (as demonstrated further below, 2.3) be derived processually from the latter.

When Lorenz, apparently unaware of these conditions, considered it possible to apply, in equivalent ways, his phylogenetic interpretation of Kant’s a priori concept to the category of time ("[...] a similar conclusion applies to the relationship between these [...] physiological processes and our interpretations of time and categories of thought"), this was an assumption that he never managed to strengthen. The circumstances rather speak in favour of the assumption that time is a typical construction 'a posteriori' which, accordingly, to a still lower degree than space would thus be made up of innate structures of a category-specific, that is temporal, nature (presupposed by Kant’s a priori concept).

This critical assessment would consequently harmonize with empirical data that question the universal status of tense as a homogeneous cognitive-linguistic category (cf. Dahl 1985: 31, 103–128). However, it leaves room for hypotheses about the possible universal status of the aspect category as founded on a primitive concept of time, intimately associated with the concept of space, viz., in the form primarily of the foreground-background and totality-partiality distinctions. This does not necessarily imply that the aspectual distinctions are innate in a ready-made shape (as presupposed by Kant’s a priori conception). They might hypothetically emerge as the outcome of interplay between prespatial analysis 'a priori' and innate cognitive capacities of a general nature (like metonymy and metaphor; see 3.8) which in ontogeny universally first develops the concept of space and then the primitive, aspectual, concept of time. In favour of such a hypothesis speak empirical data according to which children’s acquisition of linguistic aspectual distinctions precedes that of tense distinctions (cf. Thelin 1978a: 66).

These suggestions appear to offer a more dynamic interpretation of the traditional evolutionary conception of ‘innate releasing mechanisms’ (and its usually exclusively reflexive purport) in such a way that it – as distinguished from Kant’s a priori conception – correlates phylogeny and ontogeny by presupposing a cognitive coherence between innate ‘a priori’, that is reflexive, structures, on the one hand, and innate ‘a posteriori’, that is reflexively released, structures in the form of universal constructions, similar to those presumably leading to space and primitive time, on the other. Such constructions, founded on innate cognitive capacities, might in essence be equivalent to what Lorenz called ‘innate working hypotheses’. In a theory of knowledge
based on moderate realism of the cognitive-pragmatic kind it seems possible thus to demonstrate the pronouncedly methodological role of the a priori conception. It could, it appears, be replaced with advantage by the dynamic distinction between the notions of innate reflexive behaviour, on the one hand, and innate constructive behaviour, released by the former, on the other. Of course, the conception of reflexive behaviour will also turn out to have had a merely hypothetical function in those cases where it, thanks to our increasing knowledge, can be analyzed in terms of constructive processes – as was the case, for example, with Holst’s (1969–70 [1936]) important discovery of endogenous production of rhythmical stimuli as the very foundation of motor activities.

Unaware of the decisive connection with such rhythmical stimuli, Lorenz (1943: 351) actually spoke of the ability to form sequences (‘Reihen’) ”not only in space but also in time”. He considered this ability to be a ‘conditioned reflex’ and “precondition for time as form of apprehension”. Had he been aware of the connection between rhythmical stimuli and ‘Reihenbildung’, he would actually have been in a position to avoid his circular reasoning that the formation of sequences takes place in (already established) time and is equally a precondition for time. According to my interpretation, the formation of sequences is nothing more nor less than applied rhythmization (see 2.4, 3.11) and, resulting from it, divisibility and continuity (on the basis of extension). Sequencing is, more specifically, what I would call a reflexively released universal construction and precondition for space and time in their proper sense. Lorenz’s inability to see the connection between innate autonomous rhythmization and sequencing by means of ‘conditioned reflex’ apparently was due to his per se correct idea that autonomous rhythmization is not a reflex in itself. A simple solution to this dilemma I would see in the interpretation that it is the application (or direction) of the rhythmical stimuli available to (toward) things and motion, viz., in the form of attention, that is released reflexively in cases of space and time.

We may further assume that there exist various autonomous rhythms, some of which can be modified according to their applications (see 3.13). Rhythmization, understood as primary effort (investment of energy), is demonstrated clearly by its role precisely for the maxima and minima of attention as prerequisite for, among other things, visual perception. With reference to Holst, Lorenz (1943: 397) offers a pertinent description of autonomous rhythmization, presupposed specifically to underlie motion: ” […] readiness for definite actions [is] dependent on […] a rhythmic-automatic, endogenously produced, reaction-specific stimulation (‘Erregung’), which is consumed by the actual pattern of motion, but is accumulated at rest.” The reader can hardly avoid noticing the striking parallel here to the electric activity in the brain called alpha rhythm clearly observable during relaxed
wakefulness with closed eyes, but weakened when attention is applied in visual perception.

The dynamic understanding of innate cognitive capacities demonstrated above might perhaps serve as a reconciling compromise between the apparently contrary hypotheses about the genetic status of universal linguistic ability represented by, on the one hand, Noam Chomsky’s conception of the basic innateness of this ability, and Jean Piaget’s conception of its constructive derivation from innate capacities of a general cognitive nature, on the other. For a full account of this discussion, see Piattelli-Palmarini (1980; see also 3.15).

It is regrettable that Lorenz never found the opportunity to develop further, as he intended, his analysis of the concept of time. His occupation with time mainly restricted itself to a short discussion of the ‘internal clocks’ of organisms and their correction by means of ‘external time givers’ (Lorenz 1981: 231ff.). His few further references to time can be found in connection with his treatment of space. The latter is of great interest, however, and may also actually give us certain clues for assumptions about the cognitive essence of time.

When the orang-utan solves the problem of reaching the banana with the aid of a box, it applies what Lorenz (1965: 229ff; 1973: 166ff.; 1978: 190ff.) calls ‘the central space model’. That is, it first goes through the action in an ‘imaginative space’ before performing it in ‘physical space’. Lorenz assumes that such operations in ‘imaginative space’ are the very beginning of all thought and also the base for the highest and most complex human cognitive processes (cf. also Damasio 1994). Such an abstraction from actions in ‘physical space’ to ‘mental space’ as the basis of thought appears to harmonize with assumptions about the phylogenetic origin of symbolic language in performative, primarily iconic-deictic, functions, viz., as a verbal, or rather vocal, complement to physical action, pointing, gesture and facial expressions.

Lorenz also refers to language as evidence of all thought being spatial in its origin. For this per se plausible assumption he chooses to see support in Porzig’s (1950: 209ff.) examples of language ‘translating’ non-perspicuous conditions like, for example, temporal relations into spatiality. However, to speak of ‘translation’ in such cases is obviously not unambiguous. In contrast to Lorenz, Porzig in reality sees spatiality as a result of “the direction of all mental experience toward the thinglike”, that is, rather as a secondary spatial influence on non-spatiality. This is precisely the conclusion Bergson (1889; cf. also 1923: 54ff.; cf. Thelin 1990b: 116ff.; see 3.12, 4.6.4.2) appears to draw when understanding ‘materialized’, ‘spatialized’ time to be derived from ‘real time’ (temps réel or durée-qualité). Either such a conclusion is irreconcilable with the assumption of the primacy of spatiality, or what Bergson calls ‘real time’ is indeed not time at all, but a fundamental, in its origin possibly innate, cognitive entity common to the perception both of
things, space, and – by derivation from the latter – time, viz., an entity I refer to as divisibility and continuity (on the basis of extension).

Even though I believe Lorenz is basically right in his assumption about the fundamental role of spatiality in thought and language, it is evident that he is unable to draw the consequences thereof for a corresponding genetic-hierarchical analysis of the concept of time, viz., as derived from the concept of space. Captive to Kant’s general a priori understanding, he (Lorenz 1978: 191ff.) treats both categories as mutually dependent entities on one and the same cognitive level: “All orientation, also that of human beings, always relates to space and time. We cannot imagine space without observing at the same time motion in that space. Space without an event taking place in it is equally inconceivable as an event without space.” Lorenz is not only unaware here of the condition that the derivation of time from space, which would follow from his basic assumption (and is manifested more clearly in an earlier work; cf. Lorenz 1943: 351ff.), indeed makes the possibility to imagine space without motion (but certainly not the other way round) a logical necessity, but also overlooks that this is a real possibility based on a corresponding cognitive hierarchy. How would we otherwise be able to explain our observations of motionless space like, for example, a landscape of the planet Mars?

The consequence of Lorenz's basic assumption is thus that time also must have been derived secondarily from space, or more precisely, from the motion of things in space. But what kind of space are we speaking of? Does a ‘physical space’ exist at all, as presupposed by Lorenz, in the way there exist ‘physical things’ that we can touch, and the extension of which we can feel? No, in contrast to Lorenz I would maintain that space is always mental, that is, it is always a construction of the relations of things (positions and distances), and time is always a mental construction of the relations of movements/events (abstracted from space). Neither space nor time is anything ‘out there’ that we can touch. If time is assumed to be derived from space, this space must accordingly have been ‘mental’ – the only space there is. Spatiality, in other words, would be nothing else than the original cognitive mode of perceiving things and events and their relations. Accordingly, spatiality is also the natural point of departure for the entire world of concepts, abstracted from such perception. ‘Spatialization’ (‘materialization’, ‘visualization’) is, in other words, no deformation, as maintained by Bergson, but the natural appeal to that primordial principle of organization of thought and language that we can also see reflected in the way the brain arranges sensory and motor stimuli by the spatial mapping of both the body and the visual field (for the corresponding discussion of ‘image schemas’, see 1.3, 1.15).
2.3 The hypothetical evolution of space and time cognition

Space as a cognitive entity probably emerged when developed organisms, like the hominids, with the increasing consciousness of the Ego, became aware of their own bodies and learned to abstract from them as integrated part of perceived reality. This 'liberation' of the Ego apparently took place in and by 'mental space' and the possibility to manipulate its constitutive parts, that is, deliberately change the extra-subjective reality or react to changes of this reality in ways that favoured survival. This liberation, the abstraction from the absolute 'here' of perception, is likely to have presupposed a certain evolution of memory. Perception of ongoing changes of spatial states already requires comparisons with original states and a corresponding short-term (working) memory. The perception of spatial changes accomplished in the past, accordingly, requires an elementary long-term memory.

By saying this we are confronted, in turn, with the possible liberation of the Ego from the absolute 'now' of perception. Change and memory in the cognition of space may thus further involve, integrated with it, the evolution of time cognition, first in its primordial form. I am referring to the temporal-perspectival analysis of changes that clearly reveals its origin in space cognition (see 2.1), viz., the aspectual distinction between foreground events and background events. Related to these in a natural way are the two kinds of memory: to foreground together with 'close (actual) background' – short-term memory, to 'remote background' – long-term memory. The emergence of this fundamental aspectual-temporal evaluation of the immediate and mediate relevance, respectively, of events (and, indirectly, states) for the observing human subject in its now is likely to have taken place parallel to the successive differentiation of the Ego as counterpart of the Other. This differentiation may thus be assumed to have been based on remote background (habitual, iterative, generic) conditions mainly in the form of physical-spatial and actional features abstracted with the aid of memory from previous experiences.

In the aspectual meaning of remote background (interacting with the primordial correlation of (pre)aspectual totality vs. partiality and the (pre)tense distinction past vs. present, respectively; see 8.4.5–8.4.7) I would thus see also the basis for a conscious distinction between the 'then' of memory and the 'now' of immediate perception. The liberation of the human subject from the now is thus its growing consciousness of it, or rather, of the own existence in such an actual now as distinguished from previous 'nows', that is 'thens' (and, at a later stage, from future 'nows').

The consciousness of the human subject of its existence in a relative, actual now is, I would assume, of fundamental importance for its developed consciousness altogether (cf. Ch. 6). The genetic dispositions for the successive development of consciousness are thus in a natural way understood to
have emerged in parallel to the actional, social and linguistic evolution of man. We may, accordingly, imagine that the preconditions for the growth of space and time cognition are part of the same evolutionary process that offers man the necessary cognitive-pragmatic preconditions for the integrated development of memory, self-consciousness, socialization and language acquisition. The ontogenetic activation of the biological, cognitive-genetic heritage is thus conditioned in a diachronic feedback process by the human heritage of actional, social, and linguistic practice.

If we do not accept Kant’s a priori understanding of space and time, and – in consequence – question the idea that time cognition in the form of ready-made aspectual distinctions and (even less so) tense distinctions is an inherited capacity, but rather is the outcome of an ontogenetic cognitive development, what then are the phylogenetic preconditions for this development? And how would these preconditions be understood to underlie the development of space as well as time, and allow time to be derived from space?

The answers to these questions should, apparently, be looked for in the hypothetically ‘a priori’ cognition of things. The preconditions inquired into might thus, assumedly, be represented by the phylogenetically motivated perceptual modes of extension and, on this basis, divisible continuity, transferred in ontogeny metaphorically, that is in ‘mental space’ and by way of a reflexively released universal construction (see above, 2.2), from things, first to constant distances between these, and then to corresponding variable distances when covered by things in motion, that is, to their trajectories (cf. Thelin 1999: 274ff.; see 3.16, 4.6.4.1). In this way space is equally assigned extension and divisible continuity. The further procedure might look roughly like this: by way of another metaphor these features are then transferred from the trajectories of things (bodies) to their movements. The latter can now be subjected to a proper temporal analysis, that is, the continuity of motion is transformed into events (a) by being discontinued according to the observer’s/speaker’s aspectual perspective, which arranges events according to the situation-aspectual distinction foreground vs. remote background – in the former case in intimate cooperation with the further, subordinate event-aspectual distinction totality (+TOTALITY) vs. partiality (–TOTALITY); the total perspective on movements locates them in the foreground by discerning them as state-changing events, the partial perspective – in the close (actual) background by focusing on that part or phase of an event which coincides with a foreground event or other point of reference as, for example, the moment of speech; see 3.12, 4.8, 5.6; (b) by being ordered according to the observer’s/speaker’s tense perspective, that is, the perspective on events implied by the consciousness of one’s own presence in the relative ‘now’ (moment of observation/speech).

The divisibility and continuity of motion, as well as of space, may thus be assumed to have their phylogenetic origin in the perception of extension and divisible continuity of things, originating, in turn, in rhythmical stimuli. This
assumption implies a revision of Kant, keeping intact his hypothesis of the a priori or, rather, primordial nature of things, but suggesting a new interpretation of the cognitive status of space and time. Time, accordingly, is assumed to have emerged as a cognitive prototype when a change of the distances of things in space, primarily in relation to the general distinction between their closeness vs. remoteness vis-à-vis the observer, was conceived as a change-of-state, that is, when man with the aid of memory was able to establish such a change. As indicated already, the emergence of time cognition appears in a natural way to have been intimately associated with the evolution of memory. Only on the basis of such interplay may we further imagine the growth of consciousness proper, viz., with its point of departure in the primordial consciousness of the existence of the Ego in a ‘now’ separated from past and future ‘nows’. Time, in its fundamental aspectual sense, may now be defined more explicitly by its relation to memory: Events in the perspective of (‘presuppositional’) remote background are those, which have already been committed to memory, that is, of which we dispose with the aid of long-term memory. Events in the perspective of foreground and close background are those, which we, in primary perception, are in a position to cognize with the aid of short-term memory, and transfer from this to long-term memory.

Accordingly, in the latter perspective, by way of projection, now is the section in the continuity of events that we perceive, by primary perception, cognize and potentially memorize in a moment of actual self-presence; past is such a memorized section that we recall to a moment of actual self-presence, viz., by secondary perception; future is a corresponding section that is neither memorized (as in the case of past), nor can be memorized (as in the case of now), since it is never perceived primarily in a moment of self-presence but only secondarily, viz., as a result of events being cognized, by way of superordinate modality, as located beyond actual self-presence. Future is dependent on functions of memory only in the sense of access at the moment of actual self-presence to such previous experience that motivates various kinds of expectability or predictability of events (dictated by cause-effect patterns, scenarios, etc.), determined mainly by the modalities of volition, possibility, and necessity.

In the former perspective, that is that of remote background, it is not primarily a question of sections from a continuity of events but of a generalizing cognition of such previously perceived and memorized events that result in experiential structures mainly in the form of habituality and genericity. Depending on the degree of abstraction, habitual events may be subjected to tense differentiation, whereas generic events normally apply to all times (viz., at the ‘generic present’). It appears possible thus to establish that the aspectual meaning of remote background – in its most abstract form – neutralizes the category of tense and thereby reveals the hierarchically superordinate cognitive status of aspect.
The future meaning thus implies – in both perspectives – a projection of events beyond the actual moment of self-presence by means of modalities based on experiences simultaneous with or preceding the moment of self-presence. Future, in other words, does not represent any relation to ‘now’ that is cognitively symmetric with that between past and ‘now’, at least not in any deep sense. Such a symmetric idea is the secondary – and superficial – outcome of the same Systemzwang that we can trace in the symmetric – and truly secondary – spatialization of time, metaphorically locating past events behind the observer and future events in front of him.

Another consequence of the latter, secondary metaphor is that time is identified (confused) with events and ascribed motion, divisibility and continuity. Time is conceived of as if it moves from future via the stationary observer to the past (‘the flow of time’). Alternatively, the actual self-presence (‘now’) of the observer is ascribed motion ‘forward’, along fixed events changing from future to present and subsequently past events. In both cases time is ascribed a continuity that is the result of an idealization of concrete observations, in reality always made in a given ‘now’. Such continuity is secondary in relation to the phylogenetically motivated continuity, resulting from rhythmical stimuli and assumed in the present model to be transferred in ontogeny from the perception of things to the cognition of space and motion by a primary metaphor, and representing – in the case of motion – the proper object for the analytical operations of time. It is this, obviously biologically founded, continuity with its constitutive, rhythmically motivated divisibility that I would ascribe decisive significance for our understanding of the cognitive origin of time. On these assumptions, it becomes easier to realize that the dilemma of traditional temporal research was caused by the problem of reconciling the erroneous idea of continuity as a fundamental property of time with the genuinely discontinuous nature of observation and, accordingly, temporal perspective.

2.4 Endogenous rhythmization, continuity vs. discontinuity in the perceptual-cognitive processing of space and time, and the nature of ‘consciousness’

Consequently, when Holst (1969-1970 [1936]) discovered the decisive significance of the endogenous production of rhythmical stimuli for the motor activities of organisms (of obvious relevance also to human speech; cf. Lenneberg 1967: 107ff., 119ff.) it had an obvious bearing upon continuity, which in motion, according to the present model, is derived from the perception of things and the corresponding cognition of space as a precondition for the temporal analysis of events. However, since the notion of rhythm normally applies only to motion, it is evident that the property that makes conti-
nuity analyzable, with regard to things and space – as well as motion, is rather its constitutive feature of *divisibility* as the superordinate projection of underlying biological rhythmization. What happened now was that one erroneously understood the features of divisibility (rhythm) and continuity in motion as identical with time itself (James, Peirce, Bergson) or, like Lorenz, recognized their crucial role in spatial orientation, but not as a precondition for temporal orientation. Time in a way relates to the rhythm of motion as the melody to the beat of music. The role of automatic rhythmization not only in motor but also sensory activities, as well as in cognition, is obvious. Even though Lorenz himself was not in a position to see its full consequences for human perception, and in particular space and time cognition, he deserves recognition for having realized the general significance of the automatic production of rhythmical stimuli in the central nervous system discovered by Holst in earthworms and fishes. Lorenz (1996: XXXVII) gave expression to this very insight: "[The] developmental history of our field of research is essentially identical to the history of its most significant discovery. This surely lies in the recognition of the fact that, in animal and human behaviour, there is a second elementary function of the central nervous system, alongside and in addition to the reflex that plays an equally fundamental role. This secondary elementary function is the automatic, rhythmical generation of stimuli, previously documented only for the pacemaker centre of the heart."

Rhythm (and, implicitly, divisibility and continuity) may thus be assumed to constitute the biologically inherited foundation of perception and cognition by means of which humans (consciously or unconsciously) control above all their various motor activities. Such control takes place in the form of sensory feedback, that is, rhythmization should be understood also as part of sensory activities, more specifically, as a property of its component of *attention*. Thereby the automatic production of rhythmical stimuli also stands out as precondition for all perception, not only perception of motion but also the presumably innate perception of *things* in which rhythmization is reflected by divisibility and continuity (on the basis of extension), subsequently transferred by metaphor to space. In Holst’s discovery we would thus see the answer to the question about the origin of the divisibility of spatial extension and the rhythmization (phasality) of motional continuity without which by nature discontinuous spatial and temporal definitions are inconceivable (see further the discussion of partitioning (discontinuation) and Gestalt perception in 3.8–9).

It is, in other words, possible to interpret the permanent organic process of rhythmical stimulus production in humans as an active part also of the constructive procedures manifested by the cognition of space, motion and time – in feedback interplay with the perception of things and events. As the foundation of the evolution of man’s orientation in space and time, rhythmical stimuli (in more decisive ways than was assumed by Donald, 1991:
186ff.) stand out, more generally, as the *conditio sine qua non* for human activities and rationality.

_Rhythmical stimuli may be assumed, more specifically, to serve as a continuous screen without the aid of which perception is not in a position to establish spatial and temporal order in the chaos of things and happenings, that is, to subject them to a subsequent cognitive analysis into discontinuous elements._ Lorenz understood the import of Holst’s discovery mainly as a correction of the predominantly reflexive understanding of behaviour but was unable to see its relevance for theories of space and time. Nor did he associate this discovery with the so-called ‘internal clocks’ which he (Lorenz 1981: 231ff.) considered dependent merely on ‘external time givers’.

Long before Holst, the American psychologist and philosopher William James (1890: 224–290, 605–642), on the basis of his conception of ‘stream of thought (consciousness)’, made a distinction between the continuity of consciousness and the discontinuity in objects of the former. This distinction might appear at first glance to harmonize with my extended interpretation of Holst’s discovery. However, James did not, apparently, discern the true import of such a distinction and its relation to time cognition. Accordingly, he entirely omits a discussion of time in the chapter devoted to “The stream of thought” (pp. 224–290), and when speaking of the stream of consciousness in the chapter devoted to “The perception of time” (pp. 605-642), he actually does so not with regard to an assumed continuous consciousness but only to the latter’s discontinuous objects in a succession ordered by tense distinctions (p. 606ff.). This incongruity is obviously caused by the lack of a deeper understanding of time as perspective on motion. It is, no doubt, the latter that implies analysis, that is, discontinuation of the continuity assigned by ‘consciousness’ to objects in order to make at all possible their ordering; first, in a _spatial-temporal_ perspectival dimension based on the general distinction ‘close’ vs. ‘remote’, that is, by the aspectual foreground-background distinction (see 3.9); second, in a _successive-temporal_ perspectival dimension based on the ‘before-after’ distinction, that is, by the distinctions expressed by tense (as well as taxis; see Ch. 9).

It should be noted that tense distinctions represent a kind of temporal perspective that, from an evolutionary point of view, may be assumed to have emerged later than aspectual perspective and thus (from an ontogenetic and synchronic point of view) to be hierarchically subordinate to it. Tense, similar to aspect, is thus an expression of perspectival analysis, but is so from the specific point of departure implied by the observer’s/speaker’s consciousness of his actual self-presence. Events ordered by tense cannot obviously be said to represent the continuity that James originally ascribes to his stream of consciousness when distinguishing it from its objects. Merely the latter idea of continuous consciousness can be reconciled with Holst’s continuity of rhythmical stimuli and my interpretation of it as the foundation not only of space and time cognition but of human thought in general.
Nevertheless, James makes a number of important observations that give indirect support to the above interpretation. He says, for example, that "our spontaneous tendency is to break up any monotonously given series of sounds into some sort of rhythm" (p. 612), but does not realize that this rhythmization in reality is the fundamental process, that is, the one that generates divisible continuity and preconditions for partitioning/discontinuation (analysis) and order in chaos. Accordingly, this rhythmically based divisible continuity is not yet time but only the precondition for temporal analysis of events. James makes a corresponding distinction between 'empty time' ('pure time'), on the one hand, and time 'filled with content', on the other (p. 619ff). He thereby demonstrates a basically absolute understanding of time, even though he qualifies it by also saying that "awareness of change is the condition on which our perception of time's flow depends."

When James speaks of 'empty' or 'pure' time (cf. Bergson's temps réel or durée-qualité; see the discussion in 3.12, 4.6.4.2) this is indeed nothing more nor less than the original, still non-temporal, rhythmically based divisible continuity of perception that I derive from Holst's automatic production of rhythmical stimuli and subsequent partitioning (discontinuation). James even speaks of "empty time's own changes" and thereby refers to such rhythmical processes as the heart's beating, breathing, and 'the pulses of our attention'. Would it not be natural to regard such organic processes as the manifestation of various kinds of endogenous production of rhythmical stimuli? Assumptions about the location of these in the central nervous system have caused Gerald Edelman to even speak of 'temporal organs' (see 3.3).

'Pulses of attention' (for a more detailed discussion, see further below in this section) may now be understood to be related to Holst's automatic rhythmization of motor activities. As part of the sensory feedback control of the latter, such pulses of attention may thus be assumed to underlie also the perception of motion, viz., by continuously assigning divisibility (phasality) and continuity to potential instances of it – in the same way as they do in cases of things and space. Rhythmically based divisible continuity by its function of screen thus enables attentive scanning and (in the case of motion) the subsequent temporal analysis proper by way of discontinuation.

In this connection it is interesting that James (p. 636ff.) makes reference to Wilhelm Wundt's 'law of discontinuous succession' and its underlying assumption of the maxima and minima of attention as an explanation for the ordering of stimuli either as simultaneous or discontinuously successive, but never as continuously successive. This explanation demonstrates clearly that succession already implies a primary temporal, that is, aspectual-perspectival, analysis (discontinuation) of rhythmically based divisible continuity represented by the pulses of attention applied to chaos. However, the continuity of pulses of attention does not yet represent time, no more than James' 'stream of thought (consciousness)' does if conceived of without objects.
Now, James’ ‘stream of consciousness’ is obviously a theoretical abstraction in the sense that consciousness in reality is always – as an expression of the fundamental subject-object relationship (see 1.6) – consciousness of something (besides the fundamental consciousness of self-presence). This would probably be the case also when consciousness apparently is neutralized by attention in a ‘standby’ position of readiness for the perception of new information, that is, when previous information has been transferred from working memory to long-term memory. Accordingly, attention or awareness would even then not really be absolute but always directed to some extent toward objects predicted by human experience as reflected by phylogenetic, ontogenetic, and synchronic-situational conditions. In this sense, we should not exclude the possibility that ‘consciousness’ may be at work without our being aware of it. We are definitely not aware of our pulses of attention, since we cannot feel them, but we may – though only by way of abstraction – be conscious of our awareness as such, and more generally, of our consciousness as human faculty. By adding a further level of reflection, like, for example, the meta-level of neuropsychology, we would attain a complex hierarchy of consciousness (open to additional hierarchization, of course, by further generalizing, for example, in disciplines like philosophy, history of ideas, etc.). The question arises whether under these circumstances we should not altogether dispense with the notion of ‘consciousness’ where it can rather be replaced by the notion of cognition (faculty of cognition), understood as a complex of hierarchical feedback processes, and restrict its use to the awareness of the Ego as present in cognitive (alongside of biological-perceptual-actional) processing.

Moreover, from where does James’ idea of stream in ‘stream of consciousness’ come? Is it not the outcome of the same metaphor that secondarily ascribes to time the motion that properly belongs to objects? This is the conclusion we have to draw if we assume that attention is basic to ‘consciousness’, but we are not in a position to feel its pulses. Although attention can be proved to represent a genuine continuum, nobody speaks of the ‘stream of attention’. If, accordingly, the idea of ‘stream’ in ‘consciousness’ is only the outcome of a tacit inference from perceivable objective motion, this implies that James’ distinction between ‘the stream of consciousness’ and its objects is indeed a contradiction. The heart beat and breathing are examples of objective motion that we may feel and be aware (‘conscious’) of. These are rhythmical movements which together with other regular kinds of continuous change in human beings and surrounding nature may be assumed to give rise to our corresponding ‘consciousness’ of ‘life process’ and, by metaphorical transfer, of process also in ‘consciousness’ itself – as witnessed by the idea of ‘stream of consciousness’. It would, according to the present interpretation, be possible now to make a further distinction between ‘consciousness’ (in the suggested restricted sense) as cognition and its neural correlates. Whereas the latter – similar to cognition in
general – should be viewed as genuinely processual in nature, ‘consciousness’, although certainly embedded in such overall processuality, in its cognitive essence would under these circumstances rather represent the static property of the Ego’s presence – surely not its motion. Such states of presence can, accordingly, be defined only by their correlation to simultaneous processes of perception, cognition, and potential action, involving human subjects.

As a result of the ontogenetic development, and in particular the growth of memory along with space and time cognition, we may assume that the very preconditions are created for the differentiation of the Ego from the Other, as well as for its liberation from the absolute ‘here’ and ‘now’. From a certain stage of the child’s development, self-presence would be the primary content of ‘consciousness’ that is activated automatically in all kinds of behaviour. However, the ontogenetically derived spatiality and temporality of this self-presence are only potential. They are implemented only as soon as self-presence is related to objects, that is, when the latter, after having been fixed in chaos with the aid of the continuous pulses of attention, are perceived – from the Ego’s perspective – as spatially and temporally ordered, viz., as a result of their constructive analysis into discontinuous entities. That is how I would understand the indispensability of space and time cognition to the perception and cognition of things and events. Now we also more easily understand how the relatedness of self-presence to things in motion (external as well as internal to the subject) can cause such motion to be transferred secondarily (metaphorically) to the perceiving Ego and its consciousness. By analogy this ‘stream’ of ‘consciousness’ is conceived of as reconcilable also with the perception of things at rest.

Accordingly, we may understand as well that the temporal analysis of events is only the preparation for their ordering by the subsequent synthesis. It would indeed be this synthesis that, by obscuring the preceding analysis, leads to the secondary metaphor, ascribing under the impact mainly of succession the property of motion to time itself (see 3.16: Appendix).

In other words, there is in a deeper cognitive sense no ‘stream’ of ‘consciousness’, as there apparently is no ‘stream’ of ‘empty’ or ‘pure’ time. There can probably only be states of self-consciousness (embedded in cognitive processuality), either with an explicit content of objects in the form of things and events, or, in certain cases, with the restricted content of self-presence (underlying also the former); in the latter case, with or without readiness of attention, or at least with various degrees of alertness. There is thus no ‘empty’ or ‘pure’ ‘consciousness’ either. All ‘consciousness’ presupposes the consciousness of self-presence, that is, self-consciousness. Primarily, the latter is the ability to relate oneself to the Other – spatially and temporally.

When James (1890: 632) refers to Wundt’s (1874: II, 263) observations of the maxima and minima of the pulses of attention as an explanation of the
perception of the order of events, he points in a direction that is more promising than his own distinction between ‘empty’ and ‘filled’ time. With deep insight, but without offering an answer, James posits the question: “to what element in the brain-process may this sensibility [of time] be due? It cannot, as we have seen, be due to the mere duration of the process; it must be due to an element present at every moment of the process […]”. If we in this case understand James’ ‘brain-process’ rather as a cognitive process (in the form of a hypothetical construction, naturally; the corresponding neural process is still far beyond reach of our detailed observation), I would propose the following tentative answer to James’ question: the ‘element’ referred to may be understood as a phase of perceptual-cognitive processing in which the observer activates his attention by ‘directing’ a continuum of stimuli toward potential objects (things or events) in chaos and relates his self-presence to a maximum of this continuity. Objectification, thus, presumably takes place by the object being perceived simultaneously with its cognitive construction, including spatial and temporal definition. A decisive precondition for this entire process is access to a working (short-term) memory as well as a long-term memory.

The proposals made above should naturally be understood merely as a rough outline of the new possibilities at hand for defining the traditional notion of ‘consciousness’ and its relations to theories of cognitive processing, more specifically when the latter is understood to interact coherently with perception and action (linguistic action) in holistic models of human behaviour.

The above interpretation enables a new, revealing scrutiny of Descartes’ motto ‘Cogito ergo sum’ (‘I think, therefore I am’). If ‘cogito’ is synonymous with the general human ability of thinking or ‘consciousness’, and ‘consciousness’, as indicated above, is primarily consciousness of one’s own existence, then Descartes’ motto would indeed amount to saying: ‘I am conscious of my existence; therefore I (no doubt) exist’. By thus disclosing Descartes’ antecedent tacit abstraction of thought from existence, we also disclose of logical necessity the basically circular reasoning of his axiom. This, moreover, has the undesired consequence that the content of ‘consciousness’ is ascribed the status of absolute reality. It should be kept in mind, however, that existence, as well as consciousness (‘cogito’) of it, is here, in turn, the object of the superordinate ‘consciousness’ of the philosopher (of which Descartes appears to be ‘unconscious’). Our existence is and remains decisively a fact of ‘acts of consciousness’ (see below the discussion of Husserl, Ch. 6), or rather cognitive processing, interacting with perceptual processing devoid of independent, absolute objectivity. There is no way of proving the existence of anything that is not the object of cognitive processing, and cognitive processing is no absolute foundation. It is a human construction that is as relative as its objects.
The above synonymous use of the traditional notions 'consciousness' and 'thought' in their general sense of ability does not exclude the necessity of their differentiation on a lower cognitive-semantic level. 'To be conscious of something' and 'to think of something' may obviously also represent two different kinds of linguistically coded cognitive processes. This thus appears to be evident, for example, when the latter refer to events perceived in the aspectual perspective of close background (or embedded foreground). 'To be conscious of something' and 'to be thinking of something' obviously represent two semantically distinct kinds of events, viz., state vs. activity, respectively. We may understand the former kind of event (that is, state) as an expression of readiness of attention (by means of continuous rhythmization, pulses) directed toward (a) external or internal stimuli, or, (b) their objectified forms in imaginary space; the latter kind of event (that is, activity) – as the process of objectification by construction itself. Under these conditions 'thought' is hierarchically dependent on 'consciousness' in the sense of (a), but 'consciousness' in the sense of (b) is, conversely, dependent on 'thought'. If this interpretation is reasonable, it would give further support to assumptions about the fundamental role of feedback in cognitive processing (cf. Thelin 2002: 5, 8, 10ff.; see 3.2–3) and the analogous mechanism of reentry in neural processing (cf. Edelman 1989: 54ff.).

Cognition of space and time appears to be dependent on things and events in precisely this dynamic way involving hierarchical feedback interaction. If we maintain that space cannot exist without the perception of things, this is a statement about the ontogeny of space cognition. It does not preclude the possibility that the developed, individual perceptual process can be based on a strategy for discerning things that starts from hypothetical space coupled with the activation of attention. In the same way as an empty net is thrown out to catch an unidentified prey, the divisible continuity of endogenous rhythmical stimuli is directed toward chaos for the purpose of scanning, within an area limited preliminarily by, for example, the actual visual field. This understanding does not imply any recognition of Kant’s a priori space as long as the assumed strategy can be shown to have developed from the perception of things, their properties and interrelations.

Equal conditions are likely to apply also to the cognizance of time. Precisely as time – in an ontogenetic perspective – cannot exist without the perception of motion, perceived as change, we may with a high degree of probability assume that time, in its primordial, aspectual form, is involved by way of feedback interaction also in the process of perceptual scanning that moves along the continuously rhythmized chaos in order to discern changes-of-state (see 3.9).

‘Consciousness’ of space and time orientation does not necessarily imply that we are aware of our spatial and temporal constructions of reality. On reflection we may attain a certain degree of awareness of these mechanisms, but their deeper essence obviously remains an object of theoretical hypothe-
ses. No one should doubt, however, that we – consciously or unconsciously – cognize reality by means of space and time. To clarify this distinction it might – in harmony with my suggestions above – be more appropriate to speak of the cognition of space and time, on the one hand, and of the Ego’s consciousness or unconsciousness (possibly, subconsciousness) of involvement in such cognition, on the other.

By interpreting the endogenous production of automatic stimuli discovered by Holst as decisive not only for the motor functions of organisms, but also for the perception of motion and the underlying rhythmical continuum of basic attention, we have, according to my interpretation, at our disposal a hypothesis that may not only cast light on the pivotal cognition of space and time but also indicate the corresponding biological prerequisites for human thought in general.

Theories of space and time tend to be circular as to their argumentational nature. If such circularity is due to missed opportunities of coherently hierarchizing cognitive processes, this is a matter of ‘bad’ circularity. However, if we are concerned with the circularity that reflects the coherent hierarchization of cognitive processes, and more specifically the feedback mechanism rendered possible by the latter, this is a matter of natural or ‘good’ circularity. Holst’s rhythmical stimuli offer the ground for theories of space and time which accept only the latter kind of circularity.

Following Lashley (1951), Lenneberg (1967: 98, 107–120) convincingly demonstrated the important role of rhythmization for the serial character of human behaviour, especially speech. The presence of rhythmization, associated already by Wundt (see above) with attention, was later established by Trevarthen (1990a; cf. Lenneberg 1974: 570–74) also in the perception of visual space by new-born children. Trevarthen speaks of a ‘regular scanning rhythm’ originating in a ‘neural pacemaker’, assumed by him to be innate and located primarily in the reticular core. There is thus significant evidence for the present hypothesis that rhythmization is fundamental to the cognition of space as well as time. However, rhythmization of motor activities, or corresponding perception of motion, does not yet (as I have shown above) represent time (even though Lenneberg speaks of ‘time patterns’) but merely the preconditions for temporal analysis proper. The neural correlates of rhythmization, discussed by Trevarthen, are obviously a complex matter. This can probably be said to a still higher degree about the neural processes of space and time orientation based on the former. Within the framework of a biologically founded theory of space and time cognition it would appear natural, however, to examine to what extent hypotheses of corresponding perceptual and cognitive processes are reconcilable with accessible neural data, or can be formulated in inquiries for new such data.
2.5 Summary

As opposed to the a priori conception of space and time, the ‘a posteriori’ treatment proposed here founds its hypotheses on a coherent, processual-constructive model open to conditions not only of the synchrony of perceptual-cognitive and actional, including societal-linguistic, structure, but also the corresponding diachrony of this structure. Such diachrony pertains to the ontogeny of space and time cognition, coupled with the acquisition of language, as well as its phylogenetic preconditions in terms of (a) general human perceptual-cognitive and actional, and (b) societal-linguistic (intersubjective cognitive-linguistic) capacities. The notion ‘evolution’ is applied here to both (a) and (b) in view of their intimate processual interaction. This dynamic understanding is reflected in the assumption that there is within (b) a natural ‘smooth’ transition from cognitively-pragmatically motivated universal linguistic structure, on the one hand, to language-typological and language-specific structure, on the other (cf. Thelin 1986).

The idea to found a theory of human time cognition within a greater biological whole is shown to have been anticipated more generally by Konrad Lorenz’s evolutionary theory of knowledge, and, specifically, by his phylogenetic interpretation of Kantian a priori categories. However, as emerges from the critical discussion of this interpretation as applied to space and time, viz., as the inherited result of adaptation, Lorenz’s theory neglects the processual interrelations of phylogeny with ontogeny, and thus precludes the possibility of asking questions as to which components of space and time cognition are indeed innate and which may rather be ascribed to intersubjective cultural learning based on language. The linguistically based philosophy of time suggested in this book is in a position to restrict the ‘a priori’ content of time to general cognitive-pragmatic capacities and define its category-specific content in terms of coherent ontogenetic (and functional-synchronic) processes.

It is still, no doubt, to Lorenz's credit to have raised, within an evolutionary framework, the question of processual hierarchy and interaction through his restrictedly phylogenetic interpretation. Equally important is his belief that biologically founded comparative ethology may serve as a link between the natural sciences and the humanities. This view neatly harmonizes with Habermas’ New Paradigm and its endeavour to establish a “cooperative integration of philosophy and science” (see 1.1).

Another, and perhaps the most decisive, contribution made by Lorenz to biologically founded theories of motor activities, as well as perceptual-cognitive processing, was his insightful recognition of Erich von Holst’s discovery of the endogenous production of rhythmical stimuli (see also below, 3.11). The far-reaching implications of biological rhythmization not only for space and time cognition (not grasped by Lorenz), but for human thought in general, are subjected above to a comprehensive discussion,
dwelling upon the corresponding issues of divisibility and continuity, the discontinuous nature of temporal definitions, pulses of attention, and the cognitive status of ‘consciousness’, including the disclosure of Descartes’ ‘Cogito ergo sum’.

Against this background, hypotheses are advanced about the nature of time and its evolution from space, as well as the superordinate role of the category of aspect and its support of philosophical perspectivism – and corresponding appeal to variation and selection as indispensible conditions for linguistic, cognitive-pragmatic and biological functionality. Through its association with the perception of motion, more specifically, with interpretations of change-of-state and cause-effect, time – along with space – stands out as the most efficient perceptual-cognitive tool evolution has created for man’s adaptation to new situations.
3 Biopragmatism, cognitive processing of spatial/temporal perspective, and the sense of language

[How]ever far language as a cultural phenomenon may have extended beyond strictly biological capacities, it remains a profoundly adaptive biological phenomenon. And as elsewhere in biology, a full understanding of such a phenomenon and, in particular, some of its more puzzling features, is impossible outside an evolutionary framework.

Tom Givón and Bertram F. Malle (2002: VII)

3.1 Teleology, natural selection, and language semiosis in a pragmatic framework

There are at least two ways in which questions about the sense of language can be said to refer. The first possibility is that we have in mind the overall communicative purpose of language, its teleology; the second – its mode of functioning in order to achieve this purpose, that is, its sense-making or semiotic functionality. These two kinds of sense, as well as their interrelations, were essential to Michael Shapiro’s guiding work on Peircean semiotics and language, unifying in a fundamental way ‘the sense of grammar’ and ‘the sense of change’ (see Shapiro 1983, 1991). The notions of teleology and semiosis have proved to be of utmost significance for our understanding not only of language but of human behaviour in general. They may, therefore, also be assumed to form the basis of any theory of knowledge.

Teleology, thus, tears down the walls between language and other forms of human behaviour and also opens up a semiotic understanding of perception, emotion, cognition, and physical action. Truly explanatory models of language apparently cannot be achieved without attention to how man, on the basis of emotional primacy (cf. Trevarthen 1990a, 1990b, 1994; Damasio 1994; see 3.15), perceives and cognizes the world, and acts in order to change or adapt to it. This cognitive-pragmatic view of language functionality is naturally linked to the idea of language as a biologically founded fact, associated uniquely with the human species, viz., as the result of natural selection on a teleological footing. Language, as an instrument of interaction,
and intelligence, closely related to it, were the most powerful means of survival that evolution gave to mankind. The latter’s corresponding biological adaptation by developing a speech apparatus and immense brain capacities allows us, no doubt, to regard biology as the very foundation of cognitive-pragmatic models of language semiosis. This is the conception I intend to convey by my notion of biopragmatism.

The latter notion is used here in a narrow, anthroposemiotic sense, but may, in a broader sense, be understood to integrate organically the domain of biosemiotics as the science of signs in all life forms (cf. J. von Uexküll 1920, 1940; Sebeok 1973, 1979, 1991, 2001; Sebeok and Umiker-Sebeok 1992; T. von Uexküll 1992; Hoffmeyer 1996, 1999; Kull 1999). This view emerges naturally from the idea that Peirce’s pragmatically based semiotics represents “a logic of action by interpretation” (Parret 1983: 93, 105; cf. also Thelin 1994: 260). Since action is generally performed and/or perceived/cognized according to a telos (i.e., intention, in a broad sense; cf. Dewey 1972 [1896]: 104ff.), and thus is interpretative by nature, it is uncertain whether action, as suggested by Deely (1990: 23), is conceivable outside semiosis – unless, of course, abstracted tacitly from the latter. The vital interconnection between action and semiosis is thus based on their joint dependence – apparently also on the cellular/molecular level – on interpretations by subjects according to their individual perspectives and corresponding goals. This understanding appears to harmonize with the updated understanding of natural selection as it has developed in post-Darwinian evolutionary theory (cf. Hoffmeyer 1996: 58; Kull 1999: 405; Swenson 1999: 574; see also T. von Uexküll 1992: 461ff.).

With these premises it appears consistent to assume that the Darwinian principle of variation and selection (see also above, 1.11) – as the fundamental biological condition for collective survival (underlying the creation of order out of chaos and chance) – embodies teleology in evolution (cf.: Peirce: “Evolution is nothing more nor less than the working out of a definite end”; CP 1.204), and thus applies to the evolution not only of the human species but also of its characteristic linguistic and cognitive capacities. From this it does not follow that either evolution or the human species has in itself a purpose (cf. Short 1999: 126–29). Nor does it imply that teleology in language and thought is dictated in more direct ways by biological survival on other levels than the most basic ones. Space/time orientation, interacting with change-of-state and cause-effect analysis, we may assume, however, in its perceptual-sensory and cognitive foundation, to pertain by disposition to these basic levels. Although proceeding from a basically physical understanding, Peirce (CP 6. 418), as a matter of fact, made the even more far-reaching observation on the cognitive nature of space/time: “The great utility and indispensableness of the conceptions of time, space, and force, even to the lowest intelligence, are such as to suggest that they are the results of natural selection.”
The biological foundation of language semiosis is very much in line with Peirce’s pronouncedly evolutionary view of knowledge (and truth). His recognition of Darwin’s theory of evolution is well-known (CP 1.395, 7.269; cf. also Santaella Braga 1999: 6). So are his frequent references to natural selection in regard to the evolution of mind (CP 6.417–418, 7.269), if not explicitly to language. A suggestive attempt to outline a corresponding ‘evolutionary epistemology’ in terms of instruction and selection was undertaken by Popper (1975: Ch. 6). According to Campbell (1974: 450), Popper already in his major works of the 50’s and 60’s had laid the ground by which he could be “identified […] as the modern founder and leading advocate of a natural-selection epistemology”. Campbell also demonstrated that evolutionary epistemology, in various shapes, had a prehistory in the 19th century represented predominantly by ‘pre-Darwinian’, Spencerian evolutionism. It should be noted, however, that so far no evolutionary theory of knowledge, based on natural selection or not, has been developed in a systematic way within a pragmatic framework (cf. Campbell, ibid.: 438), including language as a decisive component of epistemological research. Closest, in their general direction, to such a theory are apparently Vygotskij’s (1962 [1934]) action-based conception of cognitive-linguistic development and the later versions of Piaget’s genetic psychology (cf., e.g., Piaget and Inhelder 1969).

In regard to language, the underlying assumption was in a way anticipated by Wheeler’s observation (1887; cited in Anttila 1972: 107; cf. Shapiro 1987: 165) that language change implies a tendency “to eliminate purposeless variety”. This assumption harmonizes, more generally, with Wimsatt’s understanding (1972: 13; cited in Shapiro 1987: 163) that selection “appears to be at the core of teleology and purposeful action whenever they occur”, as well as with Short’s view (1981: 380, note 3; cited in Shapiro 1987: 163; cf. also Short 1999: 120–29) that a final cause is a principle of selection. That is, we are entitled to infer that the variation-selection mechanism operates continuously in language and thought as well, subjecting them to a permanent evolutionary drift (Sapir 1921: Ch. VII; Shapiro 1987; Givón 2002a: XVIff., 17ff., 31ff.). This is what makes Saussurian synchrony appear artificial in comparison to diachrony, i.e., to change as the natural state of linguistic affairs (Coseriu 1974: 178, 236; Shapiro 1991: 5).

Considerations of the biological foundations of language, suggested already by Eric Lenneberg (1967), would, along these lines, give further support to the correction of Saussurian structuralism by Shapiro from the standpoint of Peircean semiotics (Shapiro 1991: 20ff.). As a consequence of its explicit biological foundation (consider, as an eminent example, the neuro-biological basis for space/time orientation discussed in 3.3), Peircean pragmatism, as the overall framework for semiosis, is understood to be consolidated further by the logical coherence offered by selection processes on different levels of semiosis.
Within such a framework, cognition thus becomes an integrated part of a general theory of action (cf. Thelin 1985: 158; Varela 1992: 255, 260), understood to include, accordingly, mental as well as physical action (without any Cartesian dualism, naturally). The way in which processes of thought are integrated with overall conditions of a pragmatic – indeed biopragmatic – nature, is illustrated in a clarifying way by Peirce’s central conception of abduction as the very logic of pragmatism, closely related to perception (CP 2.624, 6.522–35, 7.218–22).

3.2 Abduction and perception, perspectival variety and rule selection

I must confess that I have over the years had some problem appreciating fully the merits of abduction as the logical procedure to which Peirce ascribed the pivotal role in human thought. In my cognitive-semantic practice, the procedures of induction and deduction, especially the latter’s role according to Popper’s hypothetical-deductive method (1959: 27–34), alone appeared to warrant a reasonably exhaustive account of the logical processes involved. Today I am of another opinion. I would understand this new insight in such a way as to realize that the hierarchically highest level of thought – abduction – had (obviously) to a great extent been concealed from my consciousness.

That such a procedure had indeed to be recognized should become evident from the outcome of its working, but this I could see clearly only when I realized that abduction had to be elevated from its discrete and static role, as one (if also the dominant) of three different kinds of loosely interrelated inferences, to one integrated firmly, instead, in the logically coherent hierarchical process of semiosis. Then I became aware that the cognitive-semantic binary oppositions that I had frequently proposed as the backbone of explanatory models were in fact the result of essentially abductive (hypothesis-forming) processes. However, the latter could not have come from nowhere. Their logical primacy (according to Peirce) had to be understood, I realized, as a hierarchical-processual one, abduction being integrated in determinate ways by constant feedback with perception, as well as the procedures of induction and deduction. In the light of this discovery, I also realized that Popper’s model, actually, involved abduction, too, only tacitly. It suppressed, however, the role of induction.

My intention here is thus to reinterpret in a functionally coherent model Peirce’s logical analysis of the three inferential procedures. This decisively new model recognizes and develops further Peirce’s implicit hierarchical-processual understanding and the primacy ascribed by him to abduction. It should be emphasized, however, that, being based on the crucial introduc-
tion of processual feedback, i.e., circularity, it deviates in important respects from Peirce’s proposals when it comes to the functional content and corresponding mutual order of the logical procedures (especially induction and deduction) dictated by the static nature of traditional categorical syllogisms.

According to this model, there can be no abductive hypothesis formation without the input of sensory data being successively gathered, classified, experimented upon, and empirically systematized by induction into (tentative) rules, to be continuously tested, in turn, as to their (logical) consequences by deduction. Abduction, accordingly, is assumed to operate in a circular system as the superordinate regulative and coordinating procedure that, in order to form explanatory hypotheses about sensory data, first forwards the latter to induction for it to supply rules, then designates the testing of these rules by their application to data through deduction, compares the outcome of the hypotheses with the original data, and, finally, selects (accepts/dismisses) rules (for a more comprehensive account, see below).

Abductive hypotheses, in a circular feedback fashion, thus both emerge from and determine perception and mental/physical action. Triggered by ‘percepts’ and inherent (through feedback) in ‘perceptual judgements’, they represent the questions (‘A hypothesis ought, at first, to be entertained interrogatively’; CP 6.524) that we ask when confronted with the world in order to rationalize (explain) it and act adequately (‘To act intelligently and to see intelligently become at bottom one’; CP 7.652). Peirce’s in part metaphorical statement on the introductory page of Chapter 1 I would, correspondingly, like to interpret in such a way that perception triggers (may trigger) the abductive-hypothetical process of logical thought or ‘mental action’, as well as ‘physical action’, at the same time as it is in part determined by the cognitive structure (accumulated hierarchies of distinctions) underlying these very processes of mental and physical action. In the circular feedback model, perception should not, however, be understood to be the only possible point of departure for these processes.

In a processual feedback interpretation of this kind, Peirce’s notion of abduction might finally reveal its true significance: “The first starting of a hypothesis and the entertaining of it […] is an inferential step which I propose to call abduction” (CP 6.525; my emphasis). We are now able to understand more clearly the sensitivity of abductive hypotheses to new sensory data entering, through perception, the constant circular process of empirical rule formation and logical testing and, possibly, changing these hypotheses and their corresponding rules – rules that had determined until now our mode of perception and our mode of action. By both triggering abduction and containing it, the processually caused dual nature of perception corresponds to Peirce’s (CP 7.626ff.) distinction between ‘percepts’ and ‘perceptual judgements’, respectively (see Figure 1 below).

Abduction, more generally, appears to reflect our permanent – I would assume, genetically predisposed – striving for order in a chaotic world, in par-
ticular, for logical coherence between old and new situations in terms of cause-effect relations. The latter enable us to manipulate or to adapt to this world by calculation. Abduction, therefore, may probably be viewed as representing a biologically motivated ‘final’ cause (see the discussion below, 3.14–15), the effect of which is achieved by way of selection from a variety of possible rules that are changing over time. The act of selection implied by abduction, to my mind, is crucial to our understanding of knowledge. Variety and choice are irreconcilable with absolute rules. Abduction, accordingly, appears to be the very locus in the cognitive processual system where the choice of hypothetical rules (explanations), the latter being determined by the individual experience systematized by induction, realizes a definite perspective. Variety in the above sense is thus perspectival by nature.

This amounts to saying that if we understand abductive hypotheses to take a creative part in perception (cf. Varela 1992: 260), then perception is always carried out from a definite perspective as well, viz., as an integrated part of these hypotheses. This inference appears most natural in regard to the perception of things from various spatial perspectives, but can be demonstrated to hold equally for the perception of events from various temporal perspectives (interacting with change-of-state and cause-effect analysis). Abduction thus appears to confirm the central role in cognition ascribed to it by Peirce, namely, by the way it can be related logically to the decisive, empirically founded notion of perspective. This condition, in turn, gives support to the philosophical standpoint of perspectivism advocated (in agreement mainly with Nietzsche, Ortega y Gasset and Popper; cf. Thelin 1999: 244; 271; Givón 2002a: XVI, 223, 225, 242–249, 261–299; Givón 2002b: 33; see below, 4.2, 4.6.3) in my model of space/time cognition and its implications for epistemology (Thelin 1999, 2002).

There is thus, as one common denominator, a primary biopragmatic motive (‘final’ cause; see the discussion in 3.14) underlying all kinds of human (semiotic) behaviour – and that is the endeavour to establish order, predicted, in turn, by the instinct for survival and reflected by the corresponding need for physical and mental control of things and events ‘in space and time’. This order is relative both by its nature as a strategy of adaptation to chaos and by its foundation in anthropocentric needs. All along the way from this primary, biologically motivated human perspective, we can follow the role of perspective and its specification in the abductive processes of selection on every subsequent level of cognitive-pragmatic and linguistic processing – now as a permanent property of individual human behaviour. Variation and specialization may be caused by chance or convention, but they might as well be predicted from specific perspectives on ordering chaos, determined by idiosyncratic personal, collective, ethnic, cultural-geographic, religious, and other conditions. In the round, perspective ought to play a more fundamental role in the construal of our world picture than hitherto assumed by semiotic theory.
Strong support for this general perspectival approach has been furnished by MacWhinney's (2002: 238ff.) evolutionary conception of body-based "perspective-taking" (or "perspective-shifting") founded on the neural processes of mimesis. These processes are – by means of experientially motivated sensorimotor imagery – assumed to be involved in the gradual evolution from direct perception and action to the "ungrounded" perception of actions of others in terms of one's own body, and, subsequently, to the planning of one's own actions. Herein we might, accordingly, see the very basis for the gradual 'liberation' of the Ego and the emergence of its empathy with the Other; for learning by imitation; and for the ubiquitous presence of perspectival differentiation throughout all processes of perception, cognition, and language (cf. also Givón 2002b: 33). From a biological, cognitive-pragmatic, and linguistic view, a logic or grammar of action (correlated with perception) without these assumptions would appear inconceivable.

In a discussion of these matters, Michael Shapiro (personal communication) made the constructive proposal to treat perspective as condition on interpretation – of lower rank than variation and selection. The problem is that, if – according to this view – perspective is an 'efficient' cause and thus subordinate hierarchically to 'final' causes, then we would not apparently be able to explain how judgements involving 'final' causes – e.g., of what is necessary for survival – may differ precisely due to perspective, from culture to culture, from situation to situation, from person to person. The dynamic solution to this problem is apparently to understand perspective to operate freely through all levels of cognitive-pragmatic and linguistic processing according to my earlier interpretation of abduction, i.e., to be permanently actualized by the latter superordinate regulative and coordinating procedure of semiosis. Perspective as a condition on interpretation could indeed be understood then to be implied by conditions on selection from an inductively derived perspectival variety of rules in the way that this is implied by abduction on every single level of semiosis (all the way back to biological 'final' causes). The abductively governed logical procedures underlying semiosis of perception and mental/physical action may thus be simulated by the system of hierarchical-processual feedback relations schematized in Figure 1:
Figure 1. Logical-Cognitive Processing in Perception and Action
Figure 1 can now be understood as follows: By way of 'perceptual judgements' (see below), the input sensory data (the 'percepts') trigger abduction, which adopts these data as a 'case' and starts searching for its explanation. This can be understood such that abduction in a regulative-coordinating manner first checks previous experiential data in the rule component to see whether the 'case data' are stored and are assigned a 'rule' already. If this is so, rule access is immediate. If the case data are not stored, abduction invokes induction to supply (infer) a rule. In this instance, rule access demands more or less extensive inductive operations, engaging the entire circuit system a number of times. Abduction in this procedure submits a (tentative) rule together with the case data to deduction in order to test the outcome of the rule’s application to data. This outcome (the 'result'), which I rather call hypothetical data, reenters the system together with the rule. Abduction compares the hypothetical data with the original case data and, if they tally, accepts the rule. If not, the circular procedure continues as long as rule formation is improved or new sensory data turn up. The feedback presence of abduction in perception is represented by 'perceptual judgements’, which I interpret as automatized hypotheses about sensory data (i.e., cognitive judgements about 'percepts’) enabled by immediate ('short cut') access to the rule component. If the abductive procedure in general may be understood as fallible, 'perceptual judgements’ should be so to a relatively higher degree. However, related to an abductive procedure applied to specific data and successively leading to the establishment of an adequate rule, 'perceptual judgements’ should accordingly be characterized by a decreasing degree of fallibility. Both kinds of action, the mental (i.e., cognition) as well as the physical, are understood to be determined by 'perceptual judgements' mediating between sensory perception and mental action, and thus disposing of case data and a rule of behaviour. Physical action is optional. The latter is monitored directly by perception and cognition in a feedback fashion. Mental action, if realized (properly) by physical action, is assumed to be monitored merely indirectly, while in other cases, directly by metacognition. If done consciously, the latter is usually referred to as 'introspection’. Since perceptualization (by way of 'imagization’) appears to be indispensable also to such conscious metacognitive monitoring, we may assume the involvement here of metaperception, as well (for further explication of the model, see 3.4).

3.3 Circular feedback processing, neurobiology, and continuity

The idea of circular feedback processing was actually suggested already in Thelin (1985: 156, 160, 165ff.; cf. Varela 1992: 260) for the correlation of
perceptual and cognitive-pragmatic conditions with semantic structure. The interrelations between perception and cognition were also discussed there (p. 162ff.) in terms reconcilable with the present interpretation of abduction and Peirce’s distinction between ‘percepts’ and ‘perceptual judgements’. The model proposed was applied to the linguistic category of aspect, and thus focused on the perception and cognitive organization of motion/events (in terms of temporal perspective) within a general theory of action.

As indicated above (1.6), I have subsequently discovered strong evidence for these ideas also in an early work by John Dewey (1972 [1896]). In an illuminating reconsideration of the reflex arc concept in psychology and its mechanical application to stimulus-response, Dewey proposes a dynamic view of sensorimotor coordination: “What we have is a circuit, not an arc or broken segment of a circle. This circuit is more truly termed organic than reflex, because the motor response determines the stimulus just as truly as sensory stimulus determines movement” (p. 102). Dewey’s analysis is founded on a genuinely processual understanding of ‘coordination’ (reflected by my notion of circular feedback) as “a circuit, a continual reconstitution” and ”unity of action” (p. 99; cf. 105ff.). In criticizing ”preconceived […] ideas of rigid distinctions between sensations, thoughts and acts” (p. 97), Dewey suggests functional “mutuality of stimulation” within the sensorimotor circuit (p. 98). His basically hierarchical-processual view becomes clear from his mention of ”the orderly sequence of minor acts in a comprehensive co-ordination”. In this connection we equally find evidence of his biologically founded, pragmatic (I would say: biopragmatic) and, accordingly, teleological standpoint: “There is […] a continuously ordered sequence of acts, all adapted in themselves and in the order of their sequence, to reach a certain objective end, the reproduction of the species, the preservation of life, locomotion to a certain place” (p. 104ff., 106, 108).

The present approach has, as far as I can judge, been supported also by subsequent developments in neurobiology. In his fundamental work on consciousness, Gerald Edelman (1989: 54ff.), within his general conception of ‘neural Darwinism’, suggested his equivalent idea of ‘global mapping’, a hierarchical-processual model characterized by extensive reentry connections, i.e., what I refer to as ‘processual feedback’. Edelman's neurobiological model is intended to simulate the correlation of perception and ongoing motion, but can, to my mind, be generalized to include long-term memory and corresponding cognitive-pragmatic strategies involved in perception (of action) as well. Peirce’s understanding of the interrelations between perception and action, quoted above, is thus echoed by Edelman’s view that ”the concept of global mapping takes account of the fact that perception depends upon and leads to action”, and ”the results of continual motor activity are […] an essential part of perceptual categorization.” If we understand ”the results of continual motor activity” to be projectable (by the inclusion of long-term memory) onto action as accumulated experience, then we see
clearly the equivalence between the neurobiological model and the logical-cognitive one suggested above. This interpretation appears to emerge naturally from Edelman’s opinion (p. 139) that “distinctions among the various kinds of functions of these mappings provide major bases for the development of concepts and conceptual categorization [my emphasis].”

One of Edelman’s interesting findings (pp. 119–39) is that spatial/temporal control of motion is apparently not handled alone by the cerebral cortex but in interaction with the cortical appendages that are responsible in different ways for succession. These appendages, “the organs of succession”, are the cerebellum, the hippocampus, and the basal ganglia. The concepts of space and time may indeed involve control of succession in actions performed and perceived as an essential component, but they are obviously more than that. Whereas the neurobiological correlates of space and time are still largely concealed from observations, cognitive-linguistic studies of these categories have, as we shall see, already arrived at a number of hypotheses qualified to suggest the search for their neurobiological correlates. One promising basis for future neurobiological evidence for such cognitive-linguistic models of space/time orientation is the idea that perception of events emerges from continuity (as a precondition, in fact, for succession).

It is certainly no coincidence that Edelman (p. 33) together with his colleague George Reeke (personal communication) stumbled precisely on spatio-temporal continuity as one hypothetical requirement for “any representation of [the physical] world”. This very idea was, in more general terms, anticipated by Peirce (CP 6.169) in the form of his central conception of synechism, which insisted upon “the necessity of hypotheses involving true continuity”. Peirce never succeeded in penetrating the proper role of continuity in space/time cognition (cf. Thelin 1999: 289–97; see 4.7). However, he probably would have done so had he consistently applied his own idea of diagrammatic patterning (CP 1.383, 2.778) to the chaotic world observed. Then he might have realized that continuity is the consequence of our making chaos manageable by assigning divisibility to it. Things and events accordingly become discernible in divisible continuity by way of discontinuation, i.e., by spatial and temporal analysis proper (cf. Thelin 1999: 302; see 3.11, 3.12, 4.7).

This discontinuation of the observed world is referred to by the Gestalt distinctions figure vs. ground and parts vs. wholes, and is reflected in aspectology by the situational-perspectival distinction foreground vs. background and the event-perspectival distinction totality vs. partiality (cf. Thelin 1978a and subsequent works on aspectology), respectively. The parallel between these observations and the assumptions made in neurobiological precincts becomes still more evident if we consider that along with continuity Edelman (p. 33) included “a property Reeke calls zoomability [my emphasis] as well as a set of requirements having to do with consistency between parts of the world.” ’Zoomability’ most naturally corresponds to my notion of divisi-
bility as assigned to chaos, just as the related 'requirements' correspond to
the system of cognitive rules, which in the case of events handle temporal
(spatial/temporal, i.e. aspectual) perspectivization as part of the overall dis-
continuation involved in change-of-state and cause-effect analysis. For a
reinterpretation of Gestalt perception in the light of spatial/temporal perspec-
tive, see 3.8.

Edelman (p. 33) also makes the important observation that continuity is
"inconsistent with a fundamental symbolic representation of the world con-
sidered as an initial neural transform." This view harmonizes with my sug-
gestion that we understand divisibility as correlated to fundamental neurobi-
ological rhythmization, applied initially by attention and perception to chaos,
and consider space/time analysis to cause subsequent discontinuity by way
of binary cognitive choices of an indexical nature, subordinate to symboliza-
tion in a primordial semiotic sense (cf. Thelin 1994).

3.4 Andersen’s conception of cyclicity, and the working
of the coherent model

It is noteworthy that the need for a functional model of the circular feedback
type was, more generally, indicated already by Henning Andersen (1973). In
his early treatment of the roles of abduction and deduction in phonological
change (still today, as far as I can judge, the most important contribution to
this field of research since Peirce introduced his notion of abduction), An-
dersen discerned the "cyclical application of induction and abduction, by
which a grammar is built up [as] a goal-directed process" (ibid.: 776). In-
spired by Miller et.al.'s (1960: 29ff., 32–37) TOTE model (Test-Operate-
Test-Exit), and identifying Test with induction and Operate with abduction,
Andersen arrived at a hierarchical-processual understanding of the compo-
nents involved that differs somewhat from the one I am suggesting. The
cycle, accordingly, is conceived by Andersen to start off with induction and
continue with abduction, a process continued "until induction provides no
further cause for abduction, and the Exit phase is reached."

If we overlook the fact that input sensory data are not formalized in this
model and, what is perhaps more important, that abduction, accordingly, is
not related explicitly to perception, with which it, according to Peirce, is
most closely connected (as underlying hypotheses; cf. the two-way connec-
tion in my model above), the TOTE model causes another difficulty: the
procedure of deduction, in Andersen’s interpretation of it, is distinguished
from the induction-abduction-induction cycle and represents a separate "part
of grammar formation" (p. 777), integrated only secondarily with the former
by hierarchical superordination. Deduction is understood to "include induc-
tion", or rather, the entire induction-abduction-induction cycle. The TOTE
model is used also for deduction but reinterpreted so that Test is now deduction, Operate is the entire original cycle. This amounts to the hierarchical subordination of induction-abduction-induction to deduction, formalized as T(TOTE)TE, i.e., ‗deduction (induction-abduction-induction-exit) deduction-exit‘. This picture, to my mind, does not convey as clearly as we might expect Andersen‘s (and Peirce‘s) fertile understanding of the role of abduction as ‗unique […] vis-à-vis the other modes of inference‖.

The reason for this problematic situation, I believe, is inherent in the original TOTE model. First of all, its notion ‗Test‘ is infelicitous since it (as we see from Andersen‘s interpretation) can, apparently, be associated both with testing through deduction, which should be logical by nature, and testing understood, as it were, to be performed empirically by induction (cf. Andersen 1973: 776). In the latter case, however, I believe this is rather a metaphorical trap in which we (together with Peirce; cf. CP 6.526ff., 7.202ff.) may fall if we overlook the fact that the task of induction is basically to form and supply rules for abduction‘s hypothesis-formation, i.e., to gather, classify, experiment upon, and systematize data into rules, propelled continuously by abduction to testing through deduction. In other words, we may – if we are not aware of this continuous engagement of deduction (or detach it from the procedures of abduction and induction) – transfer its function of testing metaphorically to induction, where it essentially does not belong. From this interpretation it would follow that the original TOTE model, indeed, represents rather ‗deduction-abduction-deduction-exit‘.

This hypothetical consequence is surprising, of course. Where is induction, and can the entire cycle really start off with deduction? The answer to the first question is that induction, as the procedure implied by (subordinate to) abduction, under the circumstances would most naturally have to be included as part of Operate. The answer to the second question is that this, according to my above model, could not be the case. However, this is actually what is suggested by the complex T(TOTE)TE structure and, as it appears, by Andersen‘s formulation (p. 775; cf. also Itkonen 1999: 160, 163) that ‗abduction proceeds from an observed result [my emphasis]‘, predicted by deduction. This is, obviously, another metaphorical trap into which we may easily fall if we do not consider explicitly input sensory data as the trigger of the entire cyclical process, and of abduction above all. Abduction, in my understanding (see also Andersen‘s explicitly constructive view, p. 776), does not proceed primarily from a result but from the hypothesis that the data are the result of (can be explained by) a rule – as the effect of a cause. Induction supplies such a rule, and deduction tests it by applying it to data. The output is the ‗result‘, i.e., hypothetical data, which, by re-entering the system together with the rule, can be compared to the original case data memorized at the outset of abduction (in this secondary sense Andersen‘s formulation in any case applies). If this confrontation falsifies the rule, abduction starts an entire new circuit process over again. If the rule is con-
firmed, however, the data have been explained satisfactorily, and the rule is stored in the memory of the rule component as adequate (and immediately accessible) for future application to corresponding data. That is, similar to the abductive outset, rules presuppose memory, as does the storage of experiential data to which the rules require access. The procedure can be understood like this: Abduction in the case of a confirmed rule stores the given data and assigns to them a given rule. In the case of a falsified rule, abduction once again forwards case data to induction. With access to old and new experiential data, induction forms a new rule that abduction subjects to deductive testing, and so forth.

The rule component can be compared to a huge and complex data base in which rules are ordered according to their conditions on selection, i.e., with integrated access to experiential data. This implies a structuring of rules into the various components of human behaviour with their specific systems of rules interrelated through underlying general rules for perception and mental/physical action. One such system of rules regulates linguistic behaviour. From this system rules are selected according to the matching of case data with experiential data, decomposed by a processual hierarchy of cognitive-pragmatic binary choices (cf. below the derivation of temporal, or rather compound spatial/temporal, perspective and its implementation by aspect, 3.13). Encoding proceeds from the top to the bottom of the hierarchy, decoding, in the reverse direction; but the hierarchy is open to processual feedback so that changes can take place by abduction, invoking induction-deduction in cases of rule innovation. To assume generally that linguistic encoding implies deduction and decoding abduction (cf. Andersen, p. 777), appears problematic, since both encoding and decoding involve perception and abductive hypotheses and, consequently, deductive testing (not necessarily induction, if change is not immediately involved). Decoding, in other words, can be understood as an attempt to verify hypotheses about hypotheses or interpretations of interpretations, performed from the perspectives of the encoder and the decoder, respectively (cf. Thelin 1985: 161).

3.5 The modified role of abduction in language change

In a fixed set of rules, such as those of chess, we see the outcome of a process of rule formation that is terminated. There can be hardly any changes in the rules here due to tendencies toward a variety in their application of the kind we can see in the innovation of rules over time in other games, such as football, for example. In language, which is – through its symbiosis with thought – the active filter of most human activities, such tendencies are rooted in every single human being (cf. Short 1999: 149–54) and his/her individual needs and wishes, as we see them expressed by a huge number of choices at the various hierarchical levels of life (biological, emotional, evaluative,
rational, social, economical, ideological, aesthetic, etc.). Within collective systems of rules, individuals perceive, feel, think, speak, and act from the standpoint of their own interpretations of the world. Within the communicative needs of the collective, language accordingly serves the individual perspective. Accordingly, we may assume that we think and apparently also speak by applying rules in an individual way, the decisive point being that the output is adequate, that our individual behaviour is communicable and interpretable. Variety in rules and rule application is the constant state of affairs with which language has to live. This is the basis for language change. Variety of rules means selection of rules, and selection of rules means a possible change of rules.

In my understanding, there are roughly three possibilities involved in language change: abduction (a) selects inconsistently one of two (or more) established (adequate) rules but successively gives preference to one of them and dismisses the other(s), (b) selects a rule that applies to data inconsistently and therefore either invokes induction to supply a new (adequate) one (to replace it, or in transitory addition to it), or (c) simply dismisses it. In all three cases of change, abduction (as the regulative-selective procedure) and deduction are involved, but only in case (b) is induction involved. A differentiation between abductive and deductive change (as suggested by Andersen) does not follow from the model proposed here. Accordingly, all changes are abductive in the sense that they start with and are monitored by abduction. They also are all deductive in the sense that they involve deductive testing. Changes may be said to involve induction only to the extent that they imply the formation of new rules (triggered by new data or the reinterpretation of old data). Changes in transitory rules (Andersen’s ’adaptive’ rules; the changes he characterizes as ’deductive’) would be no exceptions. They lose their applicability gradually by the preference abduction through selection gives to the more economical structural change. As Peirce observed, ”[T]he leading consideration in abduction is the question of economy” (cited in Hookway 1985: 226).

These remarks amount to the suggestion (made possible by the coherent circular feedback model) that we make a more rigid demarcation of the procedures within Andersen’s basically cyclical conception of their functioning, and thereby assign to abduction its proper role as superordinate regulating and coordinating device. Deduction, according to this understanding, is strictly limited to the logical testing (by application to case data) of the rules selected exclusively by abduction. I am aware that this processual reinterpretation of abduction (and the correlated functional roles of induction and deduction; see 3.2) may appear alien to those not accustomed to the idea of cyclicity, but my feeling is that this alone allows us to abandon the traditional discrete-static treatment of abduction as one of three kinds of inference and to discern more clearly the nature of the prominent role ascribed to it by
Peirce within coherent models capable of being correlated with neurobiological processing (see 3.3 and 3.11).

The attempt undertaken here to simulate in a hierarchical-processual feedback model the logical procedures involved in abduction by integrating it firmly with perception and the procedures of induction and deduction appears motivated. With its aid it appears possible to dispel much of the confusion arising from earlier attempts to relate the three modes of inference to each other on the basis of incoherent or insufficiently coherent treatments. Andersen’s work (based on Peirce’s original ideas) in this respect implied an important paradigmatic change toward a coherent treatment without which the present suggestions would have appeared inconsistent. Deutscher’s (2002) criticism of Andersen (1973) confirms in important respects my preceding remarks (cf. Thelin 2002: 12–16) but, like Itkonen’s treatment (see below), fails to recognize the paradigmatic novelty of Andersen’s hierarchical-processual (cyclical) approach to the system of inferential functioning.

3.6 Itkonen’s discrete model

Therefore, I am unable fully to appreciate the criticism directed toward Andersen’s basic interpretation of abduction by Esa Itkonen (1999: 160–161). I would assume that we are concerned here rather with a misunderstanding due to Itkonen’s non-discernment of the very idea of cyclicity underlying Andersen’s proposals. This appears to emerge from the former’s processually incoherent treatment of the three modes of inference. Itkonen clearly sees that “abduction is not at all on an equal footing with induction and deduction” (p. 161) but does not get beyond an individual characterization of the three processes involved. Since he does not incorporate the idea of hierarchical-processual integration in his approach, Itkonen is unaware that it is the consequences of the latter he is treating when he defines abduction as “a composite process” (whereas induction and deduction, according to him, are “single” processes). The closest he comes to a hierarchical understanding is when he states that “abduction always contains deduction” and “abduction […] is triggered by a (perceived) fact in need of explanation.”

I see no reason in Andersen’s model to support Itkonen’s view that, according to it, abduction is “an inference pertaining only to antecedent conditions” (p. 161). This view appears to emerge from Itkonen’s difficulties in conceiving of hypothesis-formation as a cyclical process, assigning, according to my suggestion, to abduction two main tasks: (a) the regulative-coordinating one (or, ’entertaining’ one, according to Peirce), and (b) the selectional one. Abduction, therefore, of necessity involves (according to [a]) “antecedent conditions”, viz., as partaking of ‘case data’ (see above) to which rules are applied; and it involves (according to [b]), by way of selec-
tion (acceptance/dismissal), the continuous establishment of these rules (rule systems) developed from successively strengthened hypotheses.

If Andersen, according to Itkonen (p. 161), "is able to maintain his interpretation only by incongruously identifying the 'law' with the abductive inference", this would then rather be an argument in favour of Andersen’s model, since the selection of (hypothetical) rules ('laws') remains the essential task of 'abductive inference'. This certainly does not amount to saying that rules are identical with the process of abduction. As demonstrated above, this is an idea alien to the cyclical understanding of abduction. Itkonen arrives at this conclusion because he applies his discrete, i.e., incoherent, model to the assumptions of the coherent, i.e., cyclical, one. By neglecting the changing character of data (cf. above, 3.2, the distinct functions of 'sensory data', 'case data', 'experiential data', and 'hypothetical data', respectively), he conceives of abduction as a process starting and ending in identical data. This approach presumes a system of fixed rules and fixed data, which contradicts, in turn, Itkonen’s view that 'laws' are the result of abduction, i.e., if this is meant to imply that rules emerge as the result of a hypothetical-selectional formation process, involving new ('case') data and, correspondingly, induction as well. By including deduction but leaving induction outside the realm of abductive regulation, Itkonen’s model clearly applies only to rules established already as adequate for fixed data (conditions on selection).

3.7 The problem of hierarchical-processual ordering

There is, as we have seen, one major issue connected with the coherent model. This is the problem of ordering, implied by the hierarchical-processual (and cyclical) reinterpretation of the logical procedures of abduction, induction and deduction, i.e., when understood no longer as three independent modes of inference but as interdependent successive steps of logical processing (underlying perception and mental/physical action). The implicit foundation for the latter idea (and its further elaboration demonstrated by the above proposals) was laid by Peirce himself (see especially CP 7.202–207). The feature of cyclicity, suggested by Andersen and reflected by the mechanism of circular feedback in my model, is an innovation, however, and one of considerable importance for our judgements about ordering (see further below).

There is, to my knowledge, only one further analysis that develops Peirce’s dynamic understanding of the three logical procedures along similar lines, and, accordingly, actualizes the problem of ordering. That is the very important study of learning and abduction by Dan Nesher (2001; cf. also Nesher 2002). Independently of my approach, Nesher thus explicates and elaborates Peirce’s ideas in a fashion reconcilable in essence with the above
model. Nesher (2001: 32ff.) formulates “the pragmaticist method of inquiry and discovery” as “the dynamic repetition of the ordered sequence of operations of the trio abduction, deduction, and induction.” Nesher thus adopts and makes explicit the hierarchical-processual understanding implied by Peirce’s original treatment (CP 7.202ff.). The notion of repetition might even indicate Nesher’s inclusion of cyclicity as an additional constitutive component in his model, but no such component is, as far as I can discover, foreseen by him explicitly (had it been, it might, as we shall see, have influenced his view on ordering).

When it comes to ordering, Nesher is very clear: “According to Peirce, only the trio sequence of abduction, deduction, and induction (in that order) comprehends the logical method of inquiry, and only its entire operation can be understood as an empirical proof.” This is the view adopted by Nesher on the basis of Peirce’s (CP 5.171) analysis of the three procedures: “Abduction is the process of forming an explanatory hypothesis […] induction does nothing but determine a value, and deduction merely evolves the necessary consequences of a pure hypothesis […] abduction’s] only justification is that from its suggestion deduction can draw a prediction which can be tested by induction […]”.

From the latter explication it is evident that the ordering suggested by Peirce and accepted by Nesher for his further exploration is: abduction > deduction > induction. Now, this ordering differs from the one suggested by my model above (see 3.2: Figure 1): abduction > induction > deduction (> abduction > induction > deduction, and so forth). Why?

In order to explain this incongruity, let us proceed from abduction as the unanimously accepted hierarchically superordinate procedure of hypothesis formation, i.e., asking questions the answers to which are tested as to their ability to explain observed data. Our understanding of ‘testing’ here is crucial. As we can see, it is applied by Peirce (and Nesher) solely to induction, and it is here a process of (quantitative) evaluation. In order to understand properly the essence of the procedures involved, we must become aware now of the fact that their permanent objects are the observed data. If we understand abduction thus to represent (after ‘perceptual judgements’) the first reaction to observed data, and this reaction takes the shape of a question as a provisional hypothesis, what happens next? According to Peirce (and Nesher), deduction should now first draw a prediction from this hypothesis, to be tested subsequently by induction. But how can we, in the first place, draw a prediction from a hypothesis both invoked by and applied to one and the same set of data? And by what means? There is an important link missing here that has to be made explicit. In reality, it is not a hypothesis that is applied to data but it is a rule, invoked as explanation of data by a hypothesis, which is so applied. And rules (or habits) are supplied by induction, whose task it is to gather and classify experiential data and systematize them, through experimentation, into (tentative) rules for abduction that will then
select (accept/dismiss) them through deductive (logical) testing. This amounts to saying that there is (after the very first abductive question) no abduction without appeal to rules supplied by induction, and there is no logical testing through deduction without its applying these rules to data.

In other words, the hierarchical-processual order of the logical procedures should rather be the one foreseen by the traditional view of induction as proceeding from particularities to generalities, i.e., from singular data to classes and rules (or habits), tested, in turn, on new data through deduction. This condition (reflected also by the simple, unambiguous input > output order of the ‘black box’ model) is apparently what Andersen had in mind when understanding deduction to "include induction" (see above, 3.4), i.e., according to my view, as its hierarchical-processual precondition. The present interpretation appears to explain how the function of 'testing' can be ascribed metaphorically to induction, viz., as due to non-discernment of the condition that induction – not only for rule formation by experimentation but also for provisional classification as well – requires the continuous engagement of logical-deductive testing of rules and class features, respectively, specifically by way of circular feedback simulating neural reentry processes capable of immense operational velocity.

Without the explicit inclusion of cyclicity and a corresponding mechanism of circular feedback in our model, logical ordering is problematic, since hierarchical processing alone forces us to make an absolute choice between two procedures, whereas cyclicity allows of their relative order. That is to say, besides their basic internal order (discussed so far) the procedures may precede or succeed each other according to which procedure is actually activated. Finally, if we focus explicitly on rule formation, the solution of the problem appears to suggest itself. If it is true that rule formation (monitored by superordinate abduction) cannot take place without continuous deductive testing, but equally true that there can be no rule formation at all without induction, then this assigns to induction basic hierarchical-processual superiority vis-à-vis deduction. However, cyclicity allows deduction to precede induction 'in the process', for example, in cases in which abduction judges deductive testing to have failed and invokes induction to supply a new rule. Furthermore, deduction may succeed abduction immediately in those cases in which there is no need for induction to be involved. As a matter of fact, the engagement of induction already in “new abductive discovery operations” is acknowledged also by Nesher (2001: 33), notwithstanding his basic order of abduction > deduction > induction. A similar incongruity is reflected by Peirce’s (CP 6.526) additional introduction of 'abductory induction’. This transitional concept, which in reality challenges Peirce’s rather absolute understanding of hierarchical-processual order, is naturally made superfluous by the explicitly coherent model simulating thought processes by way not only of hierarchy but also of cyclicity and corresponding circular feedback.
3.8 Toward a reinterpretation of Gestalt perception

By proceeding from biological rhythmization (for a detailed account, see 3.11) as constitutive of attention and perception, and assuming its resulting assignment of diagrammatic divisibility (zoomability, focusability) and continuity to chaos to be a screen and prerequisite for discerning things and events by (chunk-wise) partitioning and further discontinuation (analysis), we are, as it will appear, in a position to confront in a clarifying way the Gestalt distinctions figure vs. ground and parts vs. wholes with the aspectual distinctions foreground vs. background and totality vs. partiality, respectively. Such a confrontation, done in order to explore the obvious but still vague relationship between the two kinds of basically perspectival selection, appears reasonable irrespective of the former being applied traditionally both to things and events, the latter normally only to events. For a detailed account of aspect distinctions, see 3.12.

It should be noted that whereas the foreground-background distinction was obviously inspired by Gestalt psychology and introduced in aspectology rather late (cf. Grimes 1975; Reinhart 1984; Chvany 1985, 1990), the totality-partiality distinction in aspectology appeared independently and not at one time. The concept of totality was proposed already in the first half of the twentieth century in the form of a privative opposition totality vs. non-totality (cf. Thelin 1978a: 31, 1990a: 30ff.). This opposition was only later (cf. Thelin 1978a: 31ff.), replaced by the equipollent opposition totality vs. partiality. The present comparison appears not only to confirm the latter proposal empirically, as we shall see, but to also motivate the introduction – already at the perceptual-sensory level – of a more general distinction between 'totality' and 'partiality', superordinate not only to the two aspectual but also the two Gestalt distinctions, and realized, accordingly, at lower levels by Gestalt part-whole and aspectual totality-partiality, respectively. It therefore also allows of a reinterpretation of the two Gestalt distinctions and, more particularly, a clarification of their hitherto fuzzy interrelations.

I would like to suggest thus that we discern and perceive things and events by way of a hierarchical and successive chunk-wise selection from the perceptual field made divisible (diagrammatized) and continuous by biological rhythmization. Perception involves abductive hypotheses which underlie this kind of superordinate partitioning selection and interact cyclically with the analysis of sensory data, attained, apparently, by some kind of scanning procedure. Hierarchical-successive partitioning selection functions in agreement with the principle of least effort, i.e., it proceeds to smaller chunks only to the extent it is needed. The selection of (potential) objects is performed according to their discernible relevance in the present situation on the basis of previous experience. This together results roughly in a cooperative strategy adapting (a) the perceptual-sensory principle of 'selecting-as-big-chunks-as-possible' (i.e., restricting the effort and degree of zooming) to
(b) the perceptual-cognitive principle of ‘selecting-chunks-I-recognize-from-previous-experience’, i.e., Gestalt perception or ‘pattern matching’ (cf. Thelin 1985: 163), by way of constant feedback. In reality, the classical laws of Gestalt perception (cf. Köhler 1929; Koffka 1935), i.e., the laws of close-ness, similarity etc., may be understood to take a mediate position and thus be implied by both principles. According to the theory, Gestalt laws are not dependent on previous experience but cooperate with it in perception. They can, therefore, still be viewed as cognitive by nature.

Objects in the perceptual field not selected for the actual chunk are left outside its focus, in what Gestalt psychology has conceived of as ‘ground’. The chunk of focus has been understood, correspondingly, to constitute ‘figure’. It is important to realize, thus, that also the figure-ground distinction, according to the present interpretation, is a result of superordinate hierarchical-successive chunk-wise selection, reflected by what in Gestalt psychology was referred to vaguely, i.e., without the indication of a hierarchical-processual relationship between the two distinctions, as the part-whole distinction. When *gestalts*, as wholes, were understood to be characterized, among other things, by being divided into figure and ground, one obviously overlooked that they are the result not only of cognitive dispositions (according to principle [b]), but also of hierarchical-successive partitioning of continuity (according to principle [a]). This interpretation harmonizes with the view expressed by Michael Shapiro in a discussion of *metonymy* in *gestalts* (personal communication; see further below in this section), in particular, regarding the latter’s reliance on part-whole relations in encompassing a hierarchical fashion figure and ground. My proposal indeed treats such part-whole relations in a broader hierarchical-processual perspective, tracing them back (and thus promoting their role, as we shall see) to their application to biologically motivated divisible continuity, the rhythmical screen, as the very foundation of attention and perception.

The flexible hierarchical-successive understanding of selection in perception thus allows us to think of attention, based on biological rhythmization (see 3.11), as being directed, if motivated, toward ever smaller chunks of the perceptual field, made divisible and continuous by the rhythmical screen. It also apparently agrees with the well-known sensory primacy of two-dimensional spatial vision as demonstrated by the elementary chunk-wise selection between *focus* and *non-focus*. Three-dimensional spatial (spatial/temporal) selection between figure and ground (foreground and background) may accordingly be assumed to have evolved secondarily as a perceptual-cognitive strategy emerging from the need for observer-related calculations of distance by way of a primarily scalar distinction, *close-remote*. The evolutionary origin of the latter distinction in cognitive-pragmatic conditions appears to be evidenced by the way – in the binary aspectual (compound spatial/temporal) distinction foreground vs. background – foreground represents state-changing events of immediate causal relevance for the ob-
server while background represents events merely of mediate causal relevance.

**GESTALT PERCEPTION**

![Diagram of Gestalt Perception]

*Figure 2. Gestalt Perception*

We may infer that the traditionally most prominent Gestalt distinction figure vs. ground must be subordinate to – indeed, derived from – not only superordinate partitioning but also the traditionally less prominent Gestalt part-whole distinction. Figure is thus always a part selected from a whole, the rest of which is left for the ground. We may, according to this hierarchical interpretation, further infer that a *gestalt*, as a whole, is also a part of a greater whole, i.e., a figure, leaving the rest of this whole for the ground. Thus, the fact that *gestalts* have been understood to be divided into figure and ground
is a consequence of their comprising not just parts but hierarchies of parts, as figures ascribed on intrinsic superordinate levels the function of wholes, i.e., in effect, subordinate gestalts. We might accordingly imagine Gestalt perception to proceed schematically as demonstrated in Figure 2.

If we apply now the above inferences to the aspectual, i.e., compound spatial/temporal, distinctions foreground vs. background and totality vs. partiality, we are in a position to assume that there is, here, too, a more general perceptual-sensory distinction between 'totality' and 'partiality' from which both the situational-aspectual foreground-background distinction and event-aspectual totality-partiality distinction apparently are derived (in the latter case by equipollent application of the general distinction). This general distinction is implied by the superordinate privative partitioning according to my proposal above of hierarchical-successive chunk-wise selection (interacting with Gestalt perception). From this we may conclude that this general, privative distinction, which we more properly should call PARTITIONING vs. NON-PARTITIONING, or FURTHER PARTITIONING vs. NO FURTHER PARTITIONING, is of such hierarchical rank that it applies to the basic levels not only of aspectual-perspectival organisation but of perceptual organisation in general, including Gestalt perception, and, therefore, also causes us to view the latter and the interrelations of its distinctions in a new light.

This conclusion agrees with the assumption that hierarchical-successive chunk-wise selection is primarily a perceptual-sensory strategy (according to principle [a] above). On subsequent levels of perceptual-abductive processing, represented by spatial and compound spatial/temporal analysis of things and situations in terms of the distinctions part-whole/figure-ground and aspectual foreground-background, respectively, as well as the compound spatial/temporal analysis of individual events in terms of the subordinate, aspectual totality-partiality distinction, the superordinate PARTITIONING-NON-PARTITIONING distinction is understood to interact with cognitive-pragmatic elements in perception. This interpretation suggests a more dynamic view also of the figure-ground and foreground-background distinctions than was traditionally the case. A corresponding tendency toward a hierarchical differentiation has been witnessed in aspectology by the introduction of the concept of close background as distinguished from remote background (today I would prefer these notions to my original actual background vs. proper background; cf. Thelin 1984a: 266; see 3.11) and by the proposal to develop further the hierarchical differentiation of the concept of background in general, especially in regard to conditions of causation (Thelin 1990a: 64–67).

According to the above interpretation, theories of Gestalt perception may thus profit from a confrontation with linguistic-semiotic theories of aspect. But, as we have seen, aspectology can also learn from Gestalt perception, if understood to be integrated in a coherent hierarchical model of perceptual-
abductive processing as suggested by the idea of successive chunk-wise selection. The latter should have consequences, however, for our understanding of the binary aspectual opposition totality vs. partiality, if ascribed (as it is here) equipollent status. The latter would not, naturally, be reconcilable with the general idea of successive privative partitioning as the governing principle, creating new wholes to be partitioned further. Under these circumstances my proposal to treat the distinction between state-changing (sequential) events in the foreground (plot line), on the one hand, and simultaneously ongoing events in the close background, on the other, as an equipollent opposition between a total and partial aspectual view of events, respectively, would appear doubtful. I think there is a natural solution to this problem, however. Before we proceed to a more detailed discussion of these matters, let me just indicate this solution by the following questions: If the idea of hierarchical-successive chunk-wise selection, i.e., partitioning, is adequate, how far may we assume this procedure to continue? Is it possible to determine its perceptual/cognitive-pragmatic limit? Can it, accordingly, be the case that the aspectual perception of events in terms of the totality-partiality distinction represents such a limit, and its equipollent nature is motivated by the fact that no further partitioning (discontinuation) is possible, or, at least, not subject to rule formation?

In his comments on my original manuscript "The conceptual structure of space and time and the organization of narrative texts" (integrated in Chapter 8 below), Michael Shapiro (personal communication) made the insightful suggestion to examine more closely the role of metonymy in connection with the discussion of aspectual totality-partiality and Gestalt perception. My attention had previously been directed primarily toward the central role of metaphor in the underlying cognitive derivation of time from space (cf. Thelin 1999; see 3.16, 4.4). My frequent references over the years to the Gestalt distinctions figure-ground and part-whole in support of the aspectual distinctions foreground-background and totality-partiality had no doubt lacked a full understanding of their correlations (in part, to be sure, due to the vague interrelations of the two Gestalt distinctions). Shapiro’s suggestion, however, appears to indicate a proper way to clarification.

The attempt above to introduce the clarity that was missing does not involve metonymy explicitly, but it is evident that the idea of hierarchical-successive chunk-wise selection, as a process selecting parts of wholes (and subordinating the rest of them), can be conceived of as metonymic in essence. If this idea is correct, it implies that metonymy may indeed be involved on levels hierarchically prior even to metaphor (precisely as this was suggested by Michael and Marianne Shapiro; cf. Shapiro & Shapiro 1988: 34), since it partakes, apparently, already of perceptual-sensory processing, whereas metaphor, judging by all, even in this fundamental pretropal sense, is introduced in perception only by cognitive, more specifically abductive-analogical processing. By also interpreting figure-ground as resulting from
the superordinate metonymic PARTITIONING vs. NON-PARTITIONING distinction, we infer as well the metonymic nature not only of figure-ground but also of the concept of gestalt comprising the latter in a hierarchical fashion as a function of part-whole.

The confrontation of Gestalt perception and aspectual perspective still leaves us with the problem of incongruity indicated already. According to the metonymy interpretation, applying satisfactorily to Gestalt perception, we would expect also the corresponding binary oppositions accounting for aspectual distinctions to exhibit the typical features of metonymy, i.e., inclusion and hierarchical prominence of the marked value (cf. Shapiro & Shapiro 1988: 30–31), demonstrated by 'part' and 'figure'. However, this is apparently not the case. Overtly, this incongruity is evidenced by the fact that, in aspect cognition, totality (the total view of events) is correlated to foreground, whereas the Gestalt whole is correlated to ground (corresponding rather to aspectual remote background); further, that aspectual partiality (the partial view of events, i.e., in one of their phases) is correlated to close background, whereas Gestalt partiality is correlated to figure (corresponding to aspectual foreground). Why is this so? Is something wrong with either Gestalt or aspect theory? My hypothesis is – and that is the only reasonable solution I can think of so far – that it is rather a matter of hierarchy.

As indicated already by my preliminary questions above, I would, in regard to the aspectual distinction totality vs. partiality, say that this is apparently an equipollent choice we encounter at the very bottom of a hierarchy of preceding successive partitioning (into ever smaller chunks of the observed world) in the shape of privative choices in the process of abduction. In other words, we have arrived at the level of perceptual-perspectival analysis of individual events where there are merely two possibilities left – either the total view or the partial view of them – because no further partitioning (discontinuation) beyond phases of motion is conceivable. This equipollent (non-metonymic) totality-partiality distinction may, however, by way of feedback, very well be assumed to partake of superordinate partitioning of chaos, made divisible (diagrammatized) and continuous by the rhythmical screen, hand in hand with privative (metonymic) partitioning (see 3.9).

In regard to the distinctions between aspectual foreground and close and remote background, the differentiation of background already indicates a cognitive-semantic structure dissolving an unambiguous polarization of inclusive and prominent foreground, on the one hand, and background understood as subordinate whole including the former, on the other. For one thing, the close background takes a mediate position, even closer to the foreground than to the remote background by its temporal relatedness to it. More generally, aspectual background, as distinguished from Gestalt ground, is (in agreement with its differentiation) something that can be paid attention to, even focussed upon, in regard not only to its temporal and causal relations to the foreground, but sometimes also in its own right. My preliminary sugges-
tion is to interpret this incongruity also along the previous lines, i.e., as the result of a transition at a determinate stage of hierarchical-privative partitioning (according to perceptual-sensory focus/non-focus, conditioned by figure-ground) to a differentiation in terms of equipollent choices. This dynamic understanding could be coupled to the above model of perceptual-abductive processing (3.2: Figure 1) in such a way that privative choices correspond to abduction, selecting, in cases of non-matching, a rule for further partitioning of case data, whereas equipollent choices correspond to abduction, selecting, in cases of matching, a rule applicable to the chunk represented by the present case data.

3.9 From biological survival to temporal perspective on situations and events

Teleology in human behaviour can be said to start in the 'final' cause (see also the discussion in 3.14) represented by the biological motive of the continued existence of the species (cf. Dewey 1972 [1896]: 104ff.). This motive is realized in the individual’s instinct for survival/self-preservation and his/her corresponding endeavour to control the situations of life, i.e., by attending to them, by perceiving, emotionally evaluating, and cognizing them, and by acting in accordance with them. To control changes of situations is vital to self-preservation, and we react to changes in order to retain status quo, or we adapt to them, if this is more adequate, by way of selection. In order to do this we must discern new states and the events (actions) causing these new states, i.e., we have to perform a perceptual-sensory, an emotional-evaluative and a perceptual-cognitive analysis, the last of which comprises cause-effect relations.

This entire procedure, in agreement with the preceding suggestions, requires the partitioning (discontinuation) of chaos, enabled by biological rhythmization assigning to it divisibility and continuity. Only under these conditions are we in a position to select, in agreement with the strategy of hierarchical-successive chunk-wise partitioning (interacting with Gestalt dispositions), parts of this continuity perceived as events causing the change from an old state of affairs to a new one. This is where space and time as means of analysis/discontinuation become involved. Relations between things are conceived, by way of discontinuation, as relations 'in' space. Changes of these relations are conceived as caused by the motion of things 'in' space. Motion, in turn, is conceived, by way of discontinuation, as 'taking place in' time (for a detailed account, see 3.16). The reason for conceiving a change in the relations of things in space as a change in time is, I suggest, that cause-effect analysis implies a reinterpretation by abstraction of the change in space as a change from one state (the old one) to a subsequent
state (the new one), introducing thereby (on the basis of compound spatial/temporal, i.e., aspectual, discrimination of events; see 3.10, 3.12) the primary temporal distinction between before and after.

Precisely as perception-cognition of things is assumed to take place by way of superordinate hierarchical-successive partitioning interacting with Gestalt dispositions of things, perception-cognition of situations and events may be assumed to take place by way of such partitioning interacting with Gestalt dispositions of situations and events. The recognition of Gestalt wholes of events may further be understood to be closely related to the interpretation of their causal-temporal relations to other events discerned in the process of partitioning. That is the reason for the assumption that temporal-perspectival (i.e., in fact, compound spatial/temporal) analysis, in the form of aspect distinctions, is involved, through gestalt wholes, already in the primary discontinuation of chaos. Thus, as suggested above, integrated with primary perceptual-sensory selection according to the superordinate privative PARTITIONING vs. NON-PARTITIONING (i.e., the promoted-generalized part-whole) distinction, there is, by way of feedback, also a preliminary aspectual analysis in terms of the equipollent totality-partiality distinction.

The latter analysis is obviously required in turn by change-of-state and cause-effect analysis, since the totality-partiality distinction enables a singling out, by totalization, of the events of the state-changing foreground, causally related in immediate ways, as distinguished from the events of the close and remote background, causally related to the foreground only in mediate ways. (It is an open question as to what extent the direct temporal relations of the close background with the foreground may be said to imply also closer causal relations.) Further, aspectual totalization is necessary for the delimitation of state-changing foreground events from each other as a prerequisite for their being sequenced and causally interconnected (see also 3.10 and the end of 3.13).

Closely related to abductive-cognitive processes of Gestalt perception, the aspectual totality-partiality distinction thus interacts with perceptual-sensory selection (the superordinate PARTITIONING vs. NON-PARTITIONING or focus/non-focus distinction) in dividing the perceptual field into the spatial-temporal-causal distinction between foreground and background. In spite of their integration in this process, four hierarchical levels of partitioning may still be distinguished, characterized by the corresponding – in essence, perspectival – distinctions: (1) the perceptual-sensory one between focus and non-focus; (2) the Gestalt ones between part and whole, as well as figure and ground; (3) the aspectual one between foreground and (close and remote) background; and (4) the aspectual one between a total view of events, i.e., totality, and a partial/phasal view of events, i.e., partiality, distinguishing generally foreground and close background, respectively. To this hierarchical differentiation corresponds the degree of perceptual-abductive progression. In the light of this hierarchical-processual understanding, it should
be no surprise that the situational-perspectival distinction between foreground and background is intuitively, and correctly so, conceived of as prior to the event-perspectival distinction between totality and partiality, although the latter partakes already of the creation of the former. This is a consequence of constant circular feedback in abduction allowing of the actualization of hierarchically subordinate distinctions as subsidiary hypothetical questions in the successive search for answers to superordinate hypothetical questions. Whereas the situational-aspectual distinction between foreground and background can be said to be hierarchically subordinate to the general (privative) PARTITIONING vs. NON-PARTITIONING distinction (represented by perceptual-sensory selection interacting with Gestalt dispositions), it is thus still hierarchically-processually superordinate to the event-perspectival equipollent totality-partiality distinction.

3.10 Change-of-state, cause-effect, and aspectual perspective in the individuation of events

The above suggestion that compound spatial/temporal (aspectual) analysis is involved already in the discrimination/individuation of events by discontinuation, and thus partaking of primary change-of-state and cause-effect analysis, implies a revision of prevailing philosophical treatments. This has to do in the first place, I believe, with the shortcomings of the traditional philosophy of time, which restricts its attention to tense by completely neglecting aspect, and usually treats time in terms of intervals and truth-conditions. In his discussion of criteria for the identity of events, Donald Davidson (1980 [1969]: 175–180), having questioned the criteria of sameness of place and time as not "clearly acceptable", suggests another criterion instead:

"[E]vents are identical if and only if they have exactly the same causes and effects" (p. 179). It is true that Davidson discusses sentences about identities (of events), but if we assume that there is a hierarchical-processual equivalence in the mode we perceive and cognize events irrespective of whether they are interpreted on the basis of immediate perception or propositional mediation, we are entitled to understand his suggestion to represent a general standpoint in regard to the cognitive-hierarchical interrelations of causation and space/time. There should be no doubt that causes and effects are crucial to discontinuation in my model also, but what Davidson (ibid.) appears to overlook when he (most pertinently) observes that "they are features guaranteed to individuate [events] in the sense not only of telling them apart but also of telling them together" is that this process of causal individuation and interconnection of events – as demonstrated above – is inconceivable without the simultaneous interaction of spatial and compound spatial/temporal, viz., aspectual, analysis and the corresponding individuation and ordering of
things ‘in’ space, and events ‘in’ space/time, by way of discontinuation. By concluding that "perhaps sameness of causal relations is the only condition always sufficient to establish sameness of events (sameness of location in space and time may be another)”, Davidson obviously admits his irresolution as to an interplay of these conditions.

Furthermore, if there is such a thing as a causally ‘natural’ direction and order of events (compare Peirce’s ‘finious actions’; CP 7.471), this would not apparently predict temporal order in an absolute and immediate sense but rather as a mediate potentiality, since the former is dependent on individual interpretations in regard to change-of-state and cause-effect. Only events perceived as (potential) changes-of-state can, in turn, be subjected to cause-effect analysis. Generally, we first ask ourselves whether there is a change, then, if there is, what caused it. If temporal (in fact, compound spatial/temporal) perspective in the shape of aspect distinctions is already involved in change-of-state analysis, one would not then expect temporal analysis to be predicted directly by causal analysis (as maintained by ‘causal’ theories of time), but rather – as suggested above – to partake of the entire hierarchical process of change-of-state and cause-effect analysis. The statement that "causal order fixes temporal order” (Mellor 1981: 8; see also Reichenbach 1956:15; Faye 1989:16ff.), then, apparently neglects the condition that they are in a relation of interdependence (by way of processual feedback) with subjective change-of-state interpretations. If understood to imply that there can be no temporal order without causal order, the latter claim is too strong, however. Events certainly can be temporally ordered without being causally ordered. Causal order cannot, consequently, be objective either (in an absolute sense), as suggested by Faye (1989: 17), since it would depend on subjective interpretations of change-of-state and cause-effect according to individual perspective (intentions, etc.). This understanding was expressed indirectly also by Davidson (1980: 172): “[I]t is not events that are necessary or sufficient as causes, but events as described in one way or another.”

The ontogenetic development of perception and cognition obviously takes place along with the development of man’s consciousness of his own existence, i.e., the process and conditions of life. Part of this consciousness is the experience of thought as a corresponding continuous process and the ability to observe this process to some extent. In the latter case we may provisionally speak of ‘internal perception’. Observations of conditions beyond the cognitive process, in or outside our bodies, we may then call ‘external perception’. In both cases, perception, obviously, is in an abductive relationship of mutual dependence to cognition as a means of rationalization, i.e., in the first case, constituting what we may understand as ‘self-reflecting’ cognition. The experience of continuous process applies to conditions of ‘external perception’, as well. The question arises as to whether this is the outcome of an unconscious projection of internal processuality onto conditions of ‘external
perception’ – as assumed by Locke (1961 [1689]: book II, Ch. 14) and Peirce (CP 1.489; W 3.68ff., 105ff.) and reflected by the assignment of divisible continuity to chaos by the above model – or an inherent property of these conditions. According to the latter alternative, man in nature would experience processuality equivalent to that of his own thought, i.e., as a property of one unitary system of biological and physical processes. The first alternative is favoured by the thesis of biological rhythmization, originating in man and, according to my suggestion, applied by man as constitutive part of attention and perception to chaos as a precondition for its partitioning (discontinuation) and ordering. This does not exclude, however, the possibility of a combination, i.e., our superimposing endogenous rhythms onto processuality (phasality) in nature (see 3.13, 4.6.1, 4.6.4.1).

At this point we have to ask the question whether perceived processes – besides a direction inherent to nature as a potentiality – can be said a priori to imply a causal and temporal order between their elements. This was in effect maintained by Mellor as a consequence of his rather absolute understanding of time: “[A]ny possible world […] must have at least one dimension, that of time” (Mellor 1995: 235); “time is the causal dimension of spacetime” (ibid.: 243); “causation is what gives time its direction and makes it linear” (p. XI). This would not be the case according to a perspectival-relational theory of time. The primary “linear” process here is void of elements that are discerned and ordered causally and temporally, i.e., we have merely the divisible continuity superimposed on the chaos of immediate perception. Only when the observer discerns phases of this continuum as (potential) changes-of-state would an analysis, as part of overall partitioning, be initiated, which leads to discontinuity. This analysis presupposes from the very beginning an intimate cooperation of cause-effect and temporal (primarily aspectual, i.e., compound spatial/temporal) interpretation, but change-of-state distinctions may be understood to trigger this complex procedure of situation analysis. Causation and time (temporal order) presuppose each other. Neither of the two is a priori in the sense both were regarded by Kant, and causation was by Mellor (p. 243): “[T]he form of inner sense is causation.” The significance of subjective interpretations according to a perspectival-relational theory of time otherwise harmonizes with the “explanatory and means-end connotations of causation” pertinently pointed out by Mellor (pp. 58ff., 79ff., 220).

The complex analysis in terms of cooperative change-of-state, cause-effect and temporal (aspectual) perspective may be assumed, thus, to hold for ‘external’ as well as ‘internal perception’. In sum, if there can be any talk of causally-temporally ordered continuity, this would be the derived, heterogeneous continuity resulting from the synthesis taking place after the causal-temporal analysis (see 3.16).

A causal or ‘natural’ order of events, to the extent that it exists, is obviously accessible to man only by means of (provisory) temporalization in
complex interpretations-by-construction (including Gestalt/pattern-matching analysis) triggered by change-of-state or, rather, hypotheses of change-of-state, since the latter, too, can be tested only by means of aspectual temporalization. Although there should indeed be a cognitive hierarchy in so far as cause-effect analysis generally presupposes the establishment of change-of-state, the prominent mechanism of processual feedback, in effect, would also enable the influence of cause-effect experience upon the successive establishment of change-of-state.

3.11 Space/time cognition, grammar, and biological rhythmization

When some 30 years ago – inspired by discussions with among others Rudolf Růžička and Hansjakob Seiler – I began to study the temporal categories, in particular, the aspect category in the Slavic languages, I could not foresee that these studies would take me to the very heart of human behaviour. Today I realize that it was consistent that the path I followed then should lead me eventually not only to the cornerstones of human perception, thought, and action, i.e., the concepts of space and time, but also to questions about their neurobiological substrata.

One of the early discoveries I made was that traditional philosophy of time thoroughly treated the category of tense, but completely lacked knowledge of aspectual distinctions. Accordingly, it became my task to suggest the relevance of aspect for the general concept of time and, apparently, for a better understanding of the ‘eternal’ philosophical problem of time, as well (cf. Thelin 1990a, b; 1999; see 3.12).

Semantic studies of aspect in the Slavic and other languages led me to fairly qualified hypotheses about time as a hierarchical-processual complex of cognitive distinctions, basically universal by nature. The most prominent feature of these distinctions turned out to be their perspectival function. It is precisely the lack of this function in traditional philosophical as well as physical theories of time that I consider to be one fundamental reason for their insufficiency. The established dependence of temporal perspective on spatial perspective further made it evident that the cognition of time can be studied exhaustively only in connection with the cognition of space.

We are entitled to ask now: are these conditions indeed relevant to our grammar models? If we consider this to be the case, we ought to ask, as well: Which type of grammar is best suited for incorporating this knowledge? The recent development toward cognitive grammar, in my opinion, is a positive answer to the first question, but not necessarily an exhaustive answer to the second question. The universal role of space and time in language, action, and thought demonstrates convincingly that the study of corresponding
grammatical structures can no longer take place in a closed language-
specific or typological system.

Expressions of space and time in language and their role in the organiza-
tion of communication are thus the manifestations of basic human behaviour,
including situation analysis in terms of change-of-state and cause-effect. We
cannot imagine that man, without an analysis of things and events in space
and time, would be able to react properly to changes of current states of af-
fairs. Ultimately, this capability is indeed a precondition for the continued
existence of the human species. These considerations give preference to a
grammar founding its hypotheses on the knowledge of man not only as a
social being but also as a part of biological evolution. They also give prefer-
ence to a grammar based on a general theory of action of the kind suggested
by Peirce, and, subsequently, for example, by psycholinguists of the
Vygotskij School (for a critical survey, see Kozulin 1986; cf. also Thelin

The answer to the second question, therefore, ought to be that we need a
grammar which – in the spirit of Peirce and other pragmatists – recognizes,
as a relevant basis, the study of human cognition as part of a superordinate
theory of action. It is not important whether we call such a grammar cogni-
tive-pragmatic or simply pragmatic. From the standpoint of biopragmatism,
it is important, however, that its explanatory and predictive adequacy should
be viewed as dependent on the degree to which it is supported by a biologi-
tical theory of human behaviour. Such a theory, as we know, was suggested
by Konrad Lorenz (1978), the founder of modern ethology. Relating to lan-
guage, it received in the past century its probably most substantial expres-
sion in Eric Lenneberg’s (1967) pioneering Biological Foundations of Lan-
guage and the subsequent works by Philip Lieberman, in particular, The
Biology and Evolution of Language (1984; cf. also Lieberman 2006), as well
as Merlin Donald’s Origins of the Modern Mind (Donald 1991). In this cen-
tury, starting with the complete mapping of the human genome and promis-
ing to become the very century of biology, research in the biological founda-
tions of language has advanced to unprecedented levels of hypothesis-
formation (for an excellent survey, see Johansson 2005). The accumulation
of indirect empirical evidence is the result mainly of interdisciplinary devel-
opments comprising linguistics, cognitive sciences, neurosciences, evolu-
tionary biology, primatology, and anthropology. These developments have
been reflected in most promising ways by such works as Tom Givón’s
(2002a) Bio-Linguistics and the collective volume The Evolution of Lan-
guage out of Pre-language (Givón and Malle 2002). A number of contribu-
tions to the latter volume have, as the reader can see, proved to be of particu-
lar relevance for the issues addressed in this book.

Even against this background I was surprised when I some years ago
found out that cognitive-linguistic models of aspect and time are supported,
as a matter of fact, by the behaviour of earth worms. That I realized this, at
first glance improbable, connection I owe to Konrad Lorenz (1996: XXXVII; see also the discussion in 2.4), who was the first to recognize the enormous importance of Erich von Holst’s (1969–70 [1936]) discovery of the endogenous production of rhythmical stimuli. Lorenz understood that the latter is the foundation not only of motion in earth worms and fishes but of behaviour in general, also in higher animals, including man. The connection with man’s cognition of space and time, however, Lorenz did not see. Conceived as an empirical base for hypotheses about man’s perception and cognition, biological rhythmization, however, offers a new understanding also in this respect. This condition was evident, in general terms, to Colwyn Trevarthen (1990a: 339ff.), who understood endogenous rhythmization (biological ‘clocks’) to constitute “the anatomical space/time frame of behaviour [formed by] regulator neurones of the reticular core” (cf. also Trevarthen 1999). But how are we to understand more specifically the connection between biological rhythms and man’s analysis of the world in terms of space and time?

Let us begin with the following question: What is the reason for our conceiving space and time as continuous? One possibility is that it is our unconscious strategy of ‘preparing’, as it were, the immediately perceived chaos by applying to it what we may compare to a homogeneous screen. In this way, chaos becomes divisible and continuous, and thus amenable to perception and cognition. Now we are in a position to apply space and time as the perspectival-relational instruments with which we perform the analysis – i.e., discrimination-by-discontinuation – of things and events. In divisible continuity I see the fundamental medium of which temporal research until now had only a faint idea. Peirce (CP 1.383, 2.778) was close to a solution in this sense when he suggested his hypothesis of “diagrammatic patterning” as a prerequisite for human perception (see 3.3), but – like William James (1890: 224–90, 605–42) and Henri Bergson (1889; 1911: 32; 1923: 54ff.) – he erroneously understood the resulting continuity as identical with time itself. For an extensive discussion of the concept of continuity in Peirce, see Thelin (1999: 289–297; see 4.7).

It should be evident by now that it is precisely in the biological rhythms, discovered by von Holst, that we, according to the present analysis, shall see the origin of divisibility and continuity, concepts that are so essential for the construction of space and time. Without the homogeneous divisibility and continuity of extension in things, their distances, motion, and trajectories, the analysis in terms of discontinuous spatial and temporal definitions – such as, for example, the aspectral distinction totality vs. partiality, but certainly also procedures of measure – would be literally unthinkable. The divisibility and continuity superimposed on potential perceptual objects may thus be assumed to originate in a neurobiological reality, viz., the production of rhythmical stimuli. With the aid of the resulting homogeneous screen atten-
tion, perception and cognition are 'directed', so to speak, toward these objects.

The fundamental role assigned to rhythmical stimuli in the present theory of space and time cognition finds independent support in other observations. Lenneberg (1967: 98, 107–120) thus demonstrated the significance of rhythmization for human behaviour in general and for the *seriality of speech* in particular. These observations are very much in line with the recent findings in Givón (2002a: 146; 2002b) and Barker and Givón (2002) which suggest the derivation of the human language-processing machinery from the primate visual information-processing system. Wilhelm Wundt’s (1874) ‘pulses of attention’ is a further indication of rhythmization as constitutive of perception. In agreement with my above interpretation is also the early discovery by Trevarthen (1974; 1990a: 339ff.; see also Lenneberg 1974: 571ff.) that the perception of visual space in newborn children is characterized by a *regular scanning rhythm*. According to Pöppel (1997) and Pöppel and Wittman (1999), “neurophysiological observations support the notion of discrete temporal processing on the basis of system states implemented by oscillations”, whereas “if temporal coherence […] as expressed by oscillations is removed as with general anaesthetics conscious representation is interrupted” and “events cannot be implemented as ‘building blocks’ of conscious activity.” Considering rhythmization and the seriality of speech, it does not appear far-fetched to assume further the origin of syntactic processes in neural structures developed for motor control (cf. Lieberman 1984: 68ff., 2006: 2; see 2.2).

Against this background, it appears legitimate for cognitive-pragmatic grammar, as distinguished from autonomous grammar, to ask questions also about the specific neurobiological (processual-physiological and anatomical) correlates of space and time. For example, is there a connection between the growth of the brain, in particular, the frontal lobe, in hominids and their developing instruments for spatial and, especially, temporal analysis (as a constitutive part of a general ability of rationalization by symbolization)? Further, isn’t it reasonable to assume that the cognitive-linguistic knowledge of space and time, incorporated in the praxis of neurosciences, might contribute to a proper formulation of neurological problems connected with disorders in spatial and temporal orientation due not only to brain injuries, lesions such as tumours and stroke, and neural dysfunction like schizophrenia, but also to age-related impairment of memory? The acquisition of concepts of things and their spatial and temporal relations in early childhood, but, equally, their successive loss due to aging and disease, was the thought-provoking theme in Jurij Oleša’s story *Liompa* (cf. Björling 1981, Thelin 1984b).
3.12 Time in philosophy and physics, and the aspectual renewal of temporal studies

Ever since man began to reflect on matters of existence, the essence of time to thinkers has been a permanent cause for worry. Of course, we know how to use calendars and clocks, how to divide, measure, and indicate time according to the conventions historically founded primarily in the apparent motion of the sun and the cycle of day and night. But how essential is this so-called *chronological time* to the overall concept of time?

On closer reflection, is it indeed time that is being determined? Is it not, conversely, motion and events that are being determined with the aid of time? We may, against the background of what has been said above, assume that what gave birth to time was probably regular, cyclic motion (cf. Thelin 1990b: 104–107; see also 8.4), viz., when man turned such rhythms of nature (conditioning, apparently, in turn, phylogenetically certain macro-types of endogenous rhythms; see 3.13) into standards for the analysis of specific *gestalts* and on this basis developed (as the hierarchical-processual continuation of superordinate partitioning interacting with Gestalt perception; see 3.8) *time proper* as an instrument primarily for the underlying aspectual-perspectival discrimination and, on this basis, the ordering of events in terms of *before-after*, only secondarily for their measurement and tense-perspectival correlation to the moment of speech. The common ideas of continuous time and, specifically, of 'moving time', accordingly, would not under these circumstances reflect essential features of time. I have suggested (2.3; see also 3.16) that the latter idea should rather be understood as a metaphor of a secondary nature – not without influence, though, on our conception of reality. If this assumption is correct, we will have to regard time in a more proper sense as an *immobile* instrument for the perspectival analysis of motion, i.e., of what we perceive as events. The notion of 'immobility' is understood to allow merely of *operational mobility*, i.e., the focus of temporal distinctions is directed by the observer toward events wherever they are located in the perceptual field.

Already at this point we realize that our spontaneous understanding of time is insufficient to give us an idea of its essence. Wittgenstein’s (1958: 42e, 89) response to St. Augustine’s (*Confessions* XI: 14, 17) famous words of resignation in this respect ("If nobody asks me I know; if someone puts the question and I have to explain, I do not know any more") was his advice to "remind ourselves" of this knowledge, i.e., to make available to our consciousness the concept of time underlying language. As distinguished from the outspokenly sceptical view that time is indefinable (cf. Gale 1968a: VII, 1968b: 4ff.), the present reflections are governed rather by the constructive spirit of Wittgenstein’s viewpoint (although in more pronouncedly cognitive-processual ways than he probably would have agreed to).
A discussion of time still cannot get round the idea of its motion (cf. 'passage of time'). We observe, 'in the now', how events take place and disappear, as it were, into the past, thereby experiencing that time goes by as well, i.e., when we look back or remember. When we look forward in expectation, we experience, conversely, that events, and with them time, move toward 'the now', before they, in turn, also become past. In this image of time's motion, our point of observation – the now – is fixed. We appear to stand on the shore of the 'stream of time' and see it passing, moving backward. According to an alternative image, we move forward ourselves, together with the now, along a fixed succession of events that change from future to present and finally to past ones. In reality, in both cases we idealize observations of concrete events made in 'a given now'. No observer can ascribe to an actual event all three temporal meanings. By abstracting unconsciously from concrete observations, we free ourselves from the now as the point of departure and have the feeling that we can move freely both forward and backward in time. Time itself receives the character of a medium in permanent and uniform motion independent of the events it orders and measures. Ever since Newton (1962 [1687]: 6–8) this idealized image was the basis for the absolute concept of time in classical physics.

The essentially relational nature of time, maintained by Leibniz (1981 [1765]:152, §16), was evident already to Aristotle (Physics: §§ 217–223). He defined time as measure ('number') of motion in regard to 'before' and 'after'. As pointed out by von Wright (1969:17), we may assume that time as duration, i.e., measure of the distance between 'before' and 'after', is preceded by temporal order, i.e., the very distinction between 'before' (old state) and 'after' (new state) as the origin of temporal meaning (together, according to my analysis, with its underlying compound spatial/temporal, i.e., aspectual, analysis; see 3.13). This understanding harmonizes with intuitive cause-effect analysis and corresponding primitive stimulus-response behaviour. It would agree with the inherent direction of events that according to thermodynamics has been assumed to follow from increasing disorder (entropy). The opposite view is maintained by Prigogine (1997:3, 26), who holds that this direction is rather the result of an increasing order established by natural processes of evolution through 'self-organization' ('order from chaos'). In agreement with this view is the striking parallel of situational analysis by human observers in assigning order to chaotic happenings, prominently through the instrument of aspectual time.

A relational theory of time rejects, however, Prigogine’s fusion of events and time on one cognitive level, which ascribes, metaphorically, motion and direction to time itself (cf. the notion 'arrow of time' inherited from Eddington, 1932, and the corresponding approach in Hewson and Bubenik 1997; see also 4.4) as essential properties and, in effect, time’s absolute existence also in a reality without observers (even before the Big Bang). This assumption leads to a circular argument as demonstrated by the view (Prigogine &
Stengers 1993: 310) that "time cannot come from timelessness." A perspectival-relational theory shows that it can. Time, accordingly, is primarily an immobile instrument used by man to create order in chaos by assigning perspective and coherence to events (rather than an observer-independent dimension resulting, in inanimate matter, from "spontaneous transformation of disorder to order"; Swenson 1999: 577). A 'natural' direction of events is not necessarily considered in our interpretations of their causal and temporal relations but depends rather on whether we perceive them as changes-of-state and, indeed, actualize their inherent (potential) direction as order – i.e., by a chain of events in the foreground of a situation – or neutralize it in its background.

As soon as one has realized that the distinction before-after implies not only points delimiting (measuring) an event or the distance between events, but also the extended procedure of ordering events – with respect to each other and to the moment of speech – the relational nature of time becomes more evident. Ordering events, precisely like ordering things ‘in’ space, proceeds from and is dependent on an individual point of observation. Time, as well as space, therefore is a matter of perspective. One type of observational point is, as we have seen, the now, i.e., the moment of the speech event. From the latter, observed events are determined in regard to tense, i.e. as belonging in the past, present, or future. The category of tense was the almost exclusive object of exploration in classical philosophy of time.

As indicated already above, linguistics discovered, however, another temporal (by nature rather compound spatial/temporal) category preceding hierarchically not only tense but also the developed temporal distinction before-after: the category of aspect (see 3.16). Although this category had been a central object of research, especially in Slavic grammar, for almost a century, it only recently was freed from its traditional confusion with either tense (and taxis; cf. Thelin 1991a, 1999: 247; see 4.2 and Ch. 9) or the semantico-syntax of the verb (cf. Thelin 1990a). We know this category through its specific modes of formalization, for example, in the Slavic languages, English, and French, but (as distinguished from tense) its cognitive-pragmatic content appears to be universal in essence. One well-known expression of aspect is the distinction between the so-called simple and continuous forms of the verb in English: to read vs. to be reading.

The category of aspect is based on a complex point of observation abstracted from (but still including as hierarchically subordinate component) the moment of observation/speech and possible tense distinctions. From this point of observation, actual perception and accumulated experience cooperate in determining the role of events in the situation observed with regard to change-of-state and cause-effect. We can imagine the situation as a theatrical scene. If events in it are understood by the spectator to represent essential changes, then he regards them as part of the scene's foreground; if not, of its background. In the latter case, events can be related directly to the fore-
ground; in this instance it is a matter of the close background. Or they are related merely indirectly to the foreground events, in which case it is a matter of the remote background, beyond the actual scene.

Consider, for example, the dramatic climax of Shakespeare’s Hamlet. Obsessed by the suspicion that Claudius had murdered his father (remote background), Hamlet, during the theatrical performance, was watching (close background) how his uncle, at the poisoning of the theatrical king (foreground), reacted by suddenly rising and thus betrayed himself (foreground).

In order to understand foreground events that advance the plot, we have to know as a rule their causal connections with both kinds of background. Parts of the close background may be not only simultaneously ongoing events but also new states, resulting from preceding changes. Parts of the remote background are previous scenes or scenes expected by the spectator to succeed. The tense dimension thus is normally involved as a component subordinate to aspectual analysis.

Like scenes, we interpret – and act in – situations of life on the basis of actual perception and accumulated experience. The latter two are individualistic, as are the factors by which they are conditioned: personal emotions, values, needs, desires, interests, convictions, expectations, apprehensions, and so forth. Causal-temporal analysis is decisive for our ability to adapt to changing situations.

According to different interpretations of situational changes, there may, for example, be different opinions as to whether an event at the moment of speech, such as a rise on the stock exchange, has ceased or continues. This shows that tense perspective (in temporal logic, as such first paid serious attention to by Paul Needham, 1975) is dependent on aspectual perspective. This dependence is evident also from the fact that in certain cases of remote background events, one is normally obliged to use the (‘generic’) present; cf.:

(3.1) Mammals GIVE birth to living babies.

Now, ordering events in foreground and background, respectively, according to the distinction between change-of-state and non-change-of-state, i.e., applying a perspective on situations, requires a simultaneous aspectual analysis of these events themselves, i.e., a perspective on events. More than 30 years ago aspectologists (cf. Thelin 1978a: 31ff.; 1990a: 30ff.) discovered that events – except those belonging in the remote background, as in 3.1 – can be subjected to either a total (+TOT) or partial (–TOT) perspective. The total perspective on an event, i.e., its delimitation with a beginning and an end, has been shown to be a prerequisite for its being included in a chain of foreground events; cf.:
(3.2) Mary LOCKED herself in her room, READ the letter and BURST into tears. The aspectual total perspective, accordingly, is also a prerequisite for the temporal distinction *before-after*. The partial perspective, i.e., a reference to a part (phase) of an event, has been shown to be a prerequisite for its presentation as going on simultaneously with a foreground event; cf.:

(3.3) Mary WAS READING a letter when I came into her room.

or with the moment of speech; cf.:

(3.4) Mary IS READING the letter now.

i.e., as taking place in the close background (the first case) or, by embedding, in the foreground (the second case; see Ch. 10).

There is some evidence that aspectologists, precisely in this event-related distinction totality vs. partiality, have found the key to understanding the essence of time. *For more than two thousand years philosophers and natural scientists have thought of time as a riddle, apparently, because they did not manage to penetrate language and its temporal categories.* Today, a linguistically based philosophy of time in the aspect category has at its disposal an instrument that among other things would explain why some of our greatest thinkers, like Aristotle, St. Augustine, and Einstein, have been at a loss for a reply to one and the same problem, viz., why the present, as distinguished from the past and the future, does not allow for measurement of time (cf. Thelin 1999: 246, 280ff., 299ff.; see also 4.2). One can say that someone read for an hour but not that someone at this very moment is reading for an hour. The explanation is conditioned not by tense but by aspect:

Measurement of time or, more properly, of the extension of events, thus requires the delimiting, total (+TOT) temporal perspective that conveys either foreground changes or, as here, embedding into these; cf.:

(3.5) Mary came home, READ for an hour and then went for a walk.

This perspective is irreconcilable with the *actual* present meaning which, as we saw above, is based contrarily on the partial temporal perspective (–TOT), i.e., a reference to events in that part (phase) of them which coincides with the moment of speech. This also explains why as a rule English simple forms *in the present* can be used only in their second meaning, i.e., of remote background, as, for example, in cases of habituality; cf.:

(3.6) Mary READS a lot.
but not in the actual meaning of foreground embedding (see example 3.4; for well-defined exceptions, e.g., the 'historical present', cf. Thelin 1990a: 34, 57ff.; 1990b: 99; see 8.2.3).

Having become aware of the significance especially of aspectual analysis for the concept of time, we understand that the problem with which philosophers and physicists have been confronted until this day is their inability to reconcile the (superficial) idea that time is continuous with the discontinuous nature of observation and temporal perspective not discerned by them. *This is the root of the classical time problem.*

Closest to achieving this insight was Henri Bergson (1911b: 32), who actually spoke of “partial views of the whole”, although by this he meant general fragmentation (without a clear distinction between courses of events and temporal categories), deforming, according to him, an original continuity (*durée-qualité*). Peirce (NEM 4.332) had, to be sure, in a corresponding way considered Firstness or ‘quality’ to be ‘without parts’ (cf. Dewey 1935; Thelin 1994; Innis 1998). Of importance in this connection is also the observation made by von Wright (1969: 7ff., 31) that the logical analysis of change-of-state leads to contradictions, unless one postulates two temporal levels: one linear time and one time “divided into bits”. He understands the former as a “macro-aspect”, the latter as a “micro-aspect”. In these notions von Wright is close to an instrumental, perspectival conception of time in spite of the fact that he summarizes his analysis as a logic of the “division of time” (rather than of events).

The time problem was not solved by the theories of relativity, and it became the pronounced dilemma of quantum theory. According to Bohr (1934: 98), a causal, i.e., continuous, study of atomic processes is impossible: “[A]ny attempt at an ordering in space-time leads to a break in the causal chain.” This discontinuity is no surprise for a perspectival-relational theory of time. It is interesting that Bohr actually took the first steps in precisely this direction and, apparently, did so under the influence of his mentor, the Danish philosopher and psychologist Höffding (for an excellent account of this background, see Faye 1991). Inspired by Einstein’s special theory of relativity, Höffding had indeed already in 1921 suggested a subjective-perspectival interpretation of time (irrespective, though, of relative motion). Bohr was convinced that the meaning of physical discoveries must be viewed as part of a philosophy related to human cognition. The observational problems of quantum theory thus led him to a dynamic-perspectival understanding of the *subject-object relations* that he, in the spirit of Höffding, considered to be "the very root of the problem of knowledge". He suspected that the answer to these problems had to be looked for in language and our mode of thinking: "[A]ll account of physical experience is, of course, ultimately based on common language, adapted to orientation in our surroundings and to tracing relationships between cause and effect" (Bohr 1963:1; cf. also Chevalley 1994: 49).
The idea that the dilemma of quantum theory (also represented by the wave-particle complementarity) might be explained by a hierarchical reconstruction of cognitive-pragmatic processes based on language, appears to have been in Bohr’s mind when he (1958: 52, 68) referred to the *analysis-synthesis strategy* as one possible expedient (and, apparently, did so under the influence of Höfding; cf. Faye 1991: 148). Since this, as already indicated (1.5; see also 3.16 and 4.7), is indeed one of the instruments necessary for a reconciliation of discontinuity with continuity in one unitary system, Bohr may thus be considered to have anticipated, at least in part, the foundation of a cognitive-hierarchical model of time derivation of the kind suggested here. That discontinuation represents analysis, like the temporal one, is obvious. Continuity, however, is more than synthesis if we assume that temporal perspective fragmentizes precisely the continuity of unanalyzed courses of events. The traditional concept of synthesis in the primary function intended by Kant (cf. the discussion in Peirce CP 1.384) can therefore be replaced by the hypothesis of a homogeneously divisible continuity (A). The latter functions, in the spirit of Peirce’s (CP 1.383, 2.778), as a screen we superimpose on the chaos of immediate perception in order to enable (temporal-perspectival) analysis (B). The latter implies discontinuity, which is subsequently subjected to synthesis proper (C). The outcome of (C) is a new, heterogeneous continuity of causally-temporally related events. It is most remarkable that Peirce (CP 4.642) in 1908 with the following words announced a paper on continuity that was never to be written: “I have, in the interval, taken a considerable stride toward the solution of continuity, having at length clearly and minutely analyzed my own conception of a perfect continuity as well as that of an imperfect continuity, that is, a continuum having topical singularities, or places of lower dimensionality where it is interrupted or divides.” For a discussion of the vital interplay of Peircean continuity and discontinuity in terms of boundary functions, see Shapiro (1993: 21–23).

In this light, we understand that the problem in physics arose when the continuous screen, which had worked satisfactorily for the macro-objects of classical physics and everyday life, turned out not to be fine-meshed enough to give us a simultaneous grip on the chaos represented by atomic micro-objects and their extreme velocities. Quantum theory, in effect, revealed the present limits of the human faculty of observation. Since micro-objects do not allow of a coherent interpretation of space/time and change/cause-effect at the level of analysis, subsequent synthesis is not possible either. Classical physics, inversely, overlooked a possible analysis and generalized synthesis, instead, as the isolated object of exploration – without giving up, though, the continuous screen. This gave birth to the idea of time’s homogeneity, mobility, and symmetric directionality as fundamental, absolute properties.

From the point of view of cognitive reality, there is no sense in denying absolute time, but it should be understood as derived secondarily from relational time. The special theory of relativity did not really remove temporal
absolutism by making time dependent on the position and relative motion of observers. Relativistic time (the observer’s 'Eigenzeit') in the shape of space-time fulfills an a priori coordinate function without the necessary prerequisites for relating space and time in a hierarchical process. Time as general ‘container’ was just changed into a “personal container” (as Mellor coined it in a seminar discussion) in which there is no place for the subject’s choice of perspective on events. Only quantum mechanics allowed of a basic discontinuous understanding of time as a relational and perspectival instrument within a unitary cognitive-pragmatic model. The asymmetry of thermodynamic entropy (or negentropy) refers to processes before their temporalization.

The possibility of so-called time travel, founded on the general theory of relativity, is by definition excluded by a perspectival-relational theory of time. According to the latter, it is also unreal that time would go more slowly because clocks (and biological processes like aging) do, owing to increasing gravity and/or relative motion.

On the other hand, a perspectival-relational theory of time allows of a new understanding of Zeno’s paradoxes. The illusion of Achilles never catching up with the tortoise or of the ever resting arrow is due to the infinite division of space and time that follows from the confusion of two distinct cognitive levels: the level of homogeneously divisible continuity of non-perspectivized motion, on the one hand, and the level of motion made discontinuous by temporal-perspectival analysis, on the other (see also below, 4.6.4).

Another classical riddle, viz., Heraclitus’s river into which we (according to the original Greek wording) both can and cannot step twice, now becomes explainable as an expression of two different temporal perspectives on the action, with focus on its object: in the former (positive) case, the river and our stepping into it as part of the remote background, with permanent identity; in the latter (negative) case, the river as part of the close background, in permanent change related directly to the foreground event of our stepping into it. This very distinction may at first glance be blurred by the condition that both propositions are embedded hierarchically in a superordinate remote background perspective due to their proverbial function. For a more detailed analysis of this riddle, see 4.6.1.

3.13 Abductive hypotheses in the perception of events, and the assignment of aspectual perspective

We are now in a position to apply the above model of abduction (Figure 1; 3.2) to the perception of events and formulate tentatively the hypotheses (hypothetical questions) emerging from the rules implicit in the proposed
treatment of aspectual perspectivization (Figure 3). According to these rules, the latter takes place in cooperation not only with change-of-state analysis, as explicated below, but also with cause-effect analysis. The explication of this analysis (and its interrelations with the two former) would demand an immensely more complex picture (still understood only in rough outline) due to the necessary simultaneous inclusion of at least two events (instead of one at a time as is the case below) and their multitude of possible interconnections, depending on whether causes and effects are activities or states (see below), and whether they belong in the foreground, close background, or remote background, respectively. These conditions give us an idea of the complexity involved in the perception and cognition of events and the corresponding scope of future research (thus justifying my simplification).

Another important preliminary concerns the relation of human endogenous rhythms in perception to processuality (phasality) inherent in the external environment (see 3.10, 4.6.1., 4.6.4.1). As I understand it, subordinate to human perception and rhythmization, there are two forms of existence in nature: motion and rest. Motion and rest – to which we may refer also as activities and states, respectively – differ by one essential feature: activities have phases, states do not. The presence or absence of phasality is one decisive feature made discernible in the chaos of nature by human endogenous rhythmization and the corresponding assignment to chaos of divisibility and continuity, subject to subsequent partitioning (discontinuation). In cases of phasality, endogenous rhythms are apparently superimposed on the external rhythms of nature (see 4.6.1, 5.7). Both kinds of rhythms may be assumed to appear in various guises and to differ, accordingly, as to the length of their phases. By way of processual feedback, endogenous rhythms may in the latter respect adapt to external rhythms (cf. day and night rhythm). They would, apparently, in a similar way coincide with external ones also in cases of performance and perception of identical activities. However, there is no reason to consider endogenous rhythms to be dependent on external rhythms in any absolute sense. They are, of course, by origin ‘natural’, too, but it is important to understand that they are applied by man for the purpose of partitioning (discontinuation) as a composite perceptual-sensory and cognitive-pragmatic procedure, and are thus, by processual feedback, dependent on conditions of change-of-state and cause-effect analysis in cooperation with spatial/temporal (aspectual) perspectivization (subsumed in Gestalt dispositions/patterns).

Consequently, endogenous rhythms may, as well, not adapt to external rhythms but still use the individual phases of the latter as basis for partitioning, i.e., for the discrimination of events, according to their own requirements. It is an open question as to whether such a differentiation takes place as a conditioned selection of primary rhythms or at an intermediate level for the assignment of specific types of divisibility sensitive to cognitive-pragmatic conditions.
As distinguished from activities, states cannot be discerned directly by endogenous rhythmization and partitioning because they lack phases to be operated upon. States can thus be delimited exclusively by surrounding activities (changes) and partitioned merely by conventional means. Only to the extent that the selection of endogenous rhythms, by way of processual feedback, is restricted by perceptual-sensory partitioning, the former may be assumed to be dependent on external rhythms, since perceptual-sensory partitioning, as we have seen (see 3.8), cannot proceed beyond phases of the latter, unless such a procedure is made conceivable conventionally (theoretically, experimentally, etc.). In the absence of tangible evidence, these reflections on the relationship between endogenous and external rhythms must of necessity remain rather speculative. For the purpose of further exploration, I will still, on the basis of these reflections, assume provisionally that the external rhythms – more specifically, phasality in the nature that we observe – are subordinate to the endogenous rhythms applied in observation.

After the preliminary remarks above, we may, by way of simplification, imagine aspectual (i.e., compound spatial/temporal) perspectivization in cooperation with change-of-state (and, implicitly, cause-effect) analysis to partake of perception/abduction of events according to the hierarchically ordered, hypothetical questions suggested in Figure 3.

In the process schematized here (and ultimately to be integrated in the overall model of abduction), the distinction between aspectual totality and partiality can (as indicated previously) be realized only as part of change-of-state analysis. Events that are interpreted as bringing about a situational change (and thus are referred to the foreground) can be so only by their delimitation/totalization in divisible (diagrammatized) chaos. This does not mean that totalization can be said to be predicted by change-of-state or partialization by change-of-state-relatedness, but rather that the distinction totality-partiality as perspectival instrument is itself (by processual feedback) involved in the analysis of events before their change-of-state properties can be determined. This very distinction may thus be assumed to be a crucial tool for man's analysis of situations (see 3.12), that is to test hypotheses about what is going on, viz., as part of attempts to discern (by totalization) and order events to see if they make sense as change-of-state (supported, in turn, by cause-effect experiences), or if they do not; or to discern (by partialization) merely phases of events that might be temporally (and, possibly, causally) related to, but not part of, change-of-state. With regard to the former condition, the situational perspective is foreground, to the latter – close background, unless we are concerned with foreground embedding, viz., in cases of activities going on simultaneously with the moment of speech (not accounted for in this somewhat simplified model; see 3.12, and Ch. 10). Such foreground embedding is applicable also to states (see 4.6.1).
The above scheme represents linguistic encoding. Decoding would, in principle, take the opposite direction but is complicated, among other things, by the extensive polysemy of aspect expressions. This, obviously, causes decoding to rely heavily on coherence in situation/discourse to establish compound spatial/temporal (aspectual) perspectives consistent with the actual interpretations of change-of-state and cause-effect. For a discussion of these still poorly known conditions, see Thelin (1990a: 29).
3.14 The distinction between ‘final’ and ‘efficient’ causation: toward a hierarchical-processual alternative

In the light of the above account of space/time cognition in event perception and, in particular, the proposed procedure of aspectual-perspectival selection involved in partitioning (discontinuation) of chaos (assigned divisibility and continuity by biological rhythmization), would it be possible to make any qualified inferences in regard to the working of teleology involved, more specifically, to the distinction between ‘final’ and ‘efficient’ causes? According to Peirce’s definition (CP 1.211–212), based on Aristotle’s proposals, the former are ‘ideal’, the latter, ‘forceful’: “[W]e must understand by final causation that mode of bringing facts about according to which a general description of result is made to come about, quite irrespective of any compulsion for it to come about in this or that particular way […] Efficient causation, on the other hand, is a compulsion determined by the particular condition of things, and is a compulsion acting to make that situation begin to change in a perfectly determinate way.”

What if we apply this distinction made by Peirce to the proposed abductively governed process of perception and mental/physical action (Figure 1, 3.2), more specifically, to rules (‘laws’) and action, respectively? This is actually what Peirce (CP 1.212) himself does when he says that “[a law] is something general […] not a force. For force is compulsion; and compulsion is hic et nunc.” Whereas ‘laws’, accordingly, may be considered to be ‘final’ causes, action cannot simply be identified with force/compulsion and ‘efficient’ causes. The reason for this is that Peirce (CP 1.265) by characterizing ‘final’ causation as ‘mental’, and ‘efficient’ causation as ‘material’, in effect makes a further distinction between mental and physical action: ”There can be no objection to a man’s engaging at one time in tracing out final, or mental, causation, and at another time in tracing out material, or efficient, causation.” Strictly applied to the above account of perception and cognition of events, including aspectual perspectivization, this interpretation of Peirce would consequently treat not only primordial biopragmatic motives (see 3.2, 3.9) but the entire system of subsequent cognitive rules and procedures as ‘final’ causation, leaving for ‘efficient’ causation, actually, merely the physical/linguistic (phonetic-graphic) implementation of aspect expressions.

Are these consequences indeed reconcilable with Peirce’s intentions? Yes, they appear to be confirmed by his further explication (CP 1.212) of the relation between ‘laws’ and (physical) action: “[T]he relation of law, as a cause, to the action of force, as its effect, is final, or ideal, causation, not efficient causation.” If my interpretation is correct, this would mean that the distinction between ‘final’ and ‘efficient’ causes may be questioned as to its usefulness in semiotic analysis, and should, perhaps, instead be replaced by
an exploration of *hierarchical distinctions in causation* (understood, so far, mainly as 'final').

A corresponding differentiation of causation should, I suggest, proceed from the processual hierarchy of cognitive rules and procedures according to the logical order of perceptual-abductive processing, i.e., the proper order of asking hypothetical questions. This order implies (in accord with Peirce) causal order merely in a *mediate* sense. For example, the reason for asking for the cause of change only after we have asked whether there is a change (and know that this is the case) is primarily a matter of perceptual-cognitive and pragmatic logic, and only secondarily a matter of causation, viz., mediate causation. When we say that a change 'causes' us to ask for its cause, this is not a matter of immediate causation (i.e., an effect caused immediately by change itself) but of mediate causation, because the immediate cause is that we, in order to react properly on the change, normally must know its cause.

Like, in turn, asking the question whether there is a change can be said to be ordered causally as a mediate effect of the need for situation control and, ultimately, biological survival, the need to react to change (through its causes) can be included in this very hierarchy primarily as mediate effect of change. Immediate causation takes place only at a level where reaction to change causes determinate action. One central, biologically founded hierarchy of mediate causation (leading eventually to adequate action) might hypothetically contain elements such as the following: CONTINUED EXISTENCE OF THE SPECIES > SELF-PRESERVATION > SITUATION CONTROL > CHANGE-OF-STATE / CAUSE-EFFECT / SPACE/TIME ANALYSIS. Hierarchies such as this should, from a biopragmatic standpoint, be understood to be superordinate to and generally determine the order of perceptual-abductive processing (and subordinate cause-effect relations). Why should we, in the first place, ask whether there is a change, if change would not (under certain circumstances) be a threat in a biologically motivated sense?

This standpoint does not prevent us, I suggest, from replacing the distinction between 'final' and 'efficient' causation by one unitary hierarchy of causation, including superordinate biological causes. This presupposes, to be sure, the dissolution of Peirce’s strict distinction between 'mental' and 'material' causation, and, as a consequence, between mental and physical action. Causation will now be differentiated only by hierarchical order and the distance between cause and effect. In this overall hierarchy we thus order causes with mediate effects (including superordinate biopragmatic causes) as well as causes calling for immediate effects, irrespective of the latter causes being mental or physical by nature (i.e., representing logical or physical 'force', respectively). That is, mental, or cognitive, causation, and physical causation may, according to this view, both have immediate effects. This new understanding appears natural in the light of growing neurobiological knowledge of processual coherence in perception, cognition, and action; and

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it finds, as we shall see, some support also in observations made by Peirce himself. In his discussion of the classification of the sciences, Peirce (CP 1.220) relates the distinction of ‘final’ and ‘efficient’ causation to the part-whole distinction as follows:

Efficient causation is that kind of causation whereby the parts compose the whole; final causation is that kind of causation whereby the whole calls out its parts. Final causation without efficient causation is helpless; mere calling for parts is what Hotspur, or any man, may do; but they will not come without efficient causation. Efficient causation without final causation, however, is worse than helpless, by far; it is mere chaos; and chaos is not even so much as chaos, without final causation; it is blank nothing.

This statement is remarkable in at least two ways: first, it appears to demonstrate the applicability of the distinction between ‘final’ and ‘efficient’ causation to a cognitive procedure such as classification; second, it could, indeed, have been written to capture my idea of divisibility, i.e. divisibility and continuity, assigned to chaos by biological rhythmization as a screen and precondition for superordinate (chunk-wise) partitioning and further discontinuation, i.e. analysis (for a corresponding discussion of analysis-synthesis in Kant and Bohr related to my model of time derivation, see 3.12). If we, as I suggest, regard the distinction between ‘final’ and ‘efficient’ causation rather as one of processual hierarchy and of mediateness/immediateness of effects, it becomes evident that superordinate (‘final’) causation ("whereby the whole calls out its parts") corresponds neatly to the mediate assignment of divisibility and continuity to chaos by rhythmical screening, whereas subordinate (‘efficient’) causation ("whereby the parts compose the whole") corresponds equally neatly to immediate discontinuation of chaos on this basis. To paraphrase Peirce, the former without the latter, i.e., assignment of divisibility without subsequent division-discontinuation, would indeed be senseless ("helpless"), but the latter without the former, i.e., division-discontinuation without divisibility (assigned to chaos), would simply be impossible ("worse than helpless") because "it is mere chaos; and chaos is not even so much as chaos, without final causation; it is blank nothing.” This interpretation appears to be supported further by Peirce’s (CP 1.227) observation of the hierarchical relationship involved in “the genesis of objects classified”: “[B]y genesis must be understood, not the efficient action which produces the whole by producing the parts, but the final action which produces the parts because they are needed to make the whole” (i.e., according to my interpretation, the whole of synthesis enabled by analysis; see 3.16).

The proposed reinterpretation of ‘final’ and ‘efficient’ causation into one unitary hierarchy of mediate and immediate causation, coherently running through the entire system of semiotic processing (allowing of superordinate biopragmatic causes to determine the order of other causes), appears to be called for by further considerations. One of these is the need to integrate on
various levels of semiosis the central function of perspective (see 3.2). Another concerns the obvious problems we encounter when attempting to reconcile the distinction between 'final' and 'efficient' causation (as defined by Peirce) with the requirements of decoding, for example, linguistic decoding. Here we would face a situation in which effects of 'efficient' causes, such as, for example, spoken or written aspect expressions, rather trigger 'final' causation. That is, we must conclude that effects of 'efficient' causes here are not 'efficient' causes (because such are supposed to be "a compulsion acting to make [the] situation begin to change in a perfectly determinate way"; CP 1.212), so they must be 'final', but, accordingly, of the lowest possible hierarchy. Doesn't this demonstrate that, primarily, it is not the kind of effect as such of a cause that (according to Peirce's definition) determines the latter's semiotic function but its hierarchical relation to other causes together with the (specified) mediacy/immediacy of its effect, irrespective of the direction of semiosis (according to encoding or decoding, respectively)?

3.15 Trevarthen’s theory of motives and the biopragmatic sense of language

In harmony with the above hierarchical-processual understanding of biologically founded causation is the theory of motives suggested by Colwyn Trevarthen (1990a, 1997). In a logically persuasive way, Trevarthen ascribes to endogenous motives – among which he gives precisely the production of rhythmical stimuli in the reticular core (1990a: 339ff.; see above, 3.11) a central position – a decisive role in cognition by setting the intrinsic conditions for brain growth and cultural learning and thus realizing the fundamental idea of genetic regulation.

Trevarthen refers clearly enough to the role of emotions and emotional evaluations for these processes. Indeed, his notion of motives is embedded, as I understand it, in a cognitive theory based on communication of emotions as an innate human property (1990a: 324) and itself a primary motive for ontogeny (cf. also Trevarthen 1994). This communicative understanding is very appealing to a cognitive-pragmatic linguist and semiotician. It enables the early foundation of cognition as an integrated part of social interaction and a dynamic view of language development as a successive process of motivated communicative refinement and adaptation to the dominating system of signs, anatomically prepared for, i.e., spoken language.

One decisive advantage of Trevarthen’s model, in comparison to Jean Piaget’s framework (cf. Piaget and Inhelder 1969: 52ff., 58ff., 95), is that we, on its basis, may assume that symbolism begins early, and before language, by the primary coupling of distinct percepts with distinct emotions, viz., as the realization of fundamental biological motives or needs (dictated
ultimately by the instinct for survival). Inspired by Trevarthen’s proposals, I allow myself the following reflections on the biopragmatic foundation of language.

The primary set of emotions is, obviously, represented by a simple opposition: ‘good’ or ‘bad’ for me. Accordingly, we have to presuppose for an early phase of cognitive development also the primeval, successive differentiation between the Self and the Other (what we may understand as the motive of socialization, in a primordial sense). This would, indeed, be a precondition for, or rather integrated part of, the activation of the motive of communication. Cognitive development, roughly, would then begin as the successive rationalization of relations between percepts (sensations, ‘senses’) and their emotional values, and, by integration, between subjects, communicating emotions and their underlying biological causes. Although differentiated further by abstraction, the underlying primary set of emotions obviously remains in force throughout ontogeny. The number of percepts (with their corresponding relational content), however, increases continuously. This could not be otherwise in an ever-changing world. This brings us to another central, presumably innate, motive: the child's attention to change-of-state.

From primarily reflexive reactions to changes of states (felt as ‘good’ or ‘bad’), the child is motivated to develop logical connections between these reactions and their consequences, thus realizing the motive of rationalization. That is, coupled with the motive of attention to change-of-state, it also by necessity activates the rational motive of discerning cause-effect relations, viz., as an instrument for predicting the consequences of actions, assuming thereby the role of causes, and thus for acting adequately itself. Motivated action may, consequently, be thought to start primarily in the shape of ‘emotional communication’. That is, the motives of change-of-state and cause-effect analysis, as distinguished from Piaget’s (1969: 4) ‘action-schemas’ (and closer to Vygotskij’s conception; 1962 [1934]: 19, 20–22; cf. also Mead 1937: 47–48), are realized as cognitive tools already in the primordial system of emotional symbolization. Within this framework, trial and error and conditioned reinforcement of new sensorimotor connections may, in my view, probably still be ascribed a definite role, albeit as a learning strategy subordinate to (directed by) the realization of motivational structure.

My interpretation of the primordial system of emotional symbolization implies a hierarchical distinction between emotions and ‘senses’. More specifically, I assume that emotionality constitutes an ‘archisense’, succeeding ‘senses’, i.e., sensory percepts, hierarchically-processually, but fulfilling by way of feedback the superordinate function of evaluative coordination. Emotion expresses value, and value presupposes symbolization on various levels, ranging from primordial emotional evaluation of ‘senses’ to increasing degrees of rational evaluation (cf. Varela 1992: 260).
According to my interpretation of his theory of motives, Trevarthen takes a stand that differs not only from Piaget’s, but also from Chomsky’s proposals. It may appear, perhaps, to be closer to Chomsky’s thesis of innate cognitive (i.e., cognitive-linguistic) capacities, but it does not agree to give absolute preference to the semiotic system of spoken language. This is also my understanding. The crucial question is now how specific we understand the motivational program to be (cf. Trevarthen 1990a: 335). There is today no compelling evidence, as far as I can see, for postulating universal, specifically grammatical motives, as suggested by Chomsky (cf. Chomsky 1976, 1992). However, we should in future research probably be open to hypotheses correlating more dynamically phylogeny and ontogeny also with regard to the language capacity (see 2.2). For example, to what extent would the ability of the human foetus to discriminate speech sounds from other sounds be ascribed to neurogenetic predisposition (cf. Lieberman 1984: 332)? The significance of such questions for future research in biolinguistics as well as experimental psycho- and neurolinguistics was addressed with an equivalent, open and diversified attitude in Givón (2002b: 39ff.).

There are evident candidates, however, for innate motives for emotional-cognitive development, viz., of a general regulative kind, from which linguistic behaviour as part of general human behaviour – i.e., specifically, language structure on a par with other semiotic systems – can be derived. Besides the fundamental system of logical procedures governed by abduction, we have already observed rhythmization and the corresponding strategy of partitioning by way of primordial metonomy (see 3.8), with resulting divisible continuity as a precondition for discontinuation (analysis). There is, further, as a complement to this primarily horizontal motive, the vertical strategic motive of hierarchization and corresponding decomposition in terms of hierarchically ordered binary oppositions (Roman Jakobson’s binarism was understood by him to be an innate cognitive feature). A precondition for the role of change-of-state and cause-effect analysis in increasing rationalization (itself a superordinate motive), as well as for the motives of socialization/communication, is the fundamental motive of memorization. Knowledge of the growth of short-term memory and long-term memory and their cooperation in emotional-cognitive development is crucial to our understanding of human behaviour in most aspects. Rationalization is carried out further by the motive of symbolization and strategies of abstraction by analogy subordinate to it, such as the motives of imagization (I cannot think of any better word) and metaphorization. The latter is demonstrated to be active in deep cognitive processes of ontogenetic development, such as, for example, the construction of space and time on the basis of rhythmization (see 3.16). Understood as innate regulative dispositions to emotional-cognitive development, motives, as we can see already from this preliminary outline, appear to form a complex logical hierarchy open to further exploration within Trevarthen’s framework.
In line with these assumptions, the cognitive strategy of analyzing the world by modelling it in the form of sensorimotor-based *images* (referred to sometimes as ‘internal space’ by omission of the temporal component) may be understood as the capacity for symbolization, activated before, and thus, conditioning, linguistic symbolization. It appears reasonable to assume that the growth of the latter, accordingly, is an outcome of the general, primary growth of rationalization from primordial bioemotional structure. This development leads successively to a relationship between *emotional* and *rational* symbolic content, characterized by the latter’s continuous accumulation and differentiation, but equally by the former’s unchanging status as a superordinate regulative factor. Linguistic symbolization develops rationalization further through original image-based modelling to an extent vastly exceeding basically bioemotional symbolization. That is apparently why (images of) predominantly rational (factual) states are more readily described in explicit and logically coherent ways by language than are emotional states. In other words, with the growth of linguistic symbolization, there is a successive increase in rational thought accompanied by a corresponding differentiation and refinement of its crucial tool of image-based manipulation.

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This might, roughly, be how language and thought, emotionally motivated, are successively and inseparably entwined in ontogeny, and, thus, inveigle us into believing that this was so from the beginning. The complexity of linguistic structure already in early-preschool-age children reflects, according to this view, the complexity of their symbolic thought as a universal feature of ontogenetic development, predicted, independently of language, by bioemotionally motivated cognitive strategies of the human species. Universal semantic and syntactic features are basically expressions of properties and relations of things and events in situations perceived and cognized according to such innate motivational structure. That is, there would be no innate linguistic universals, but there would be innate cognitive motives predicting the universal basis for the ontogeny of spoken language, or any other semiotic system fulfilling the role of basic instrument for human communication, and thus activating these motives. This biopragmatic interpretation of language, which is understood to be in harmony with Trevarthen’s emotionally based theory of motives, does not contradict the condition (indicated above) that, in the course of human evolution, linguistic communication has had a definite impact not only on the anatomical-functional adaptation of the organs of speech and hearing and the central nervous system but probably also on the special development of those genetic dispositions to cognition, *the activation of which is enhanced by linguistic communication*, in particular, the motive of symbolization. Equivalent conclusions were arrived at by Lieberman.
3.16 Summary and The space/time model in outline

It is difficult to think of any other categories as suitable as space and time to entrust with the guidance through the complex hierarchy of semiotic processes manifested by language. Only through language can we proceed to the semiosis of perception, emotion, rational thought, and action, and approach the biological foundations of all these forms of human behaviour. It would be encouraging if the present attempt to correlate the categories of space and time – in particular, regarding their role in the linguistic category of aspect – with the biological-regulative motive of reticular rhythmization (Trevarthen 1990a) would not only indicate a feasible way toward an adequate model of space and time as pivotal human, i.e., basically universal, cognitive instruments (for an outline of the hypotheses emerging from the observations above, see the end of this section), but also give us a general idea of the nature of the semiosis involved.

In the latter respect, more light appears to be shed on the conditions of teleology/causation implied by processes of selection throughout the various levels of the overall hierarchy of semiosis. Based on the distinction between mediate and immediate causation, a processual-hierarchical treatment is proposed as an alternative to the distinction between ‘final’ and ‘efficient’ causation.

Fundamental, biologically founded hierarchies of causation are understood to be superordinate to and to determine generally the order of perceptual-abductive processing. Abduction, accordingly, is related processually to induction and deduction in a circular feedback model, and, most importantly, ascribed the regulative-coordinating role in the semiosis of perception and mental/physical action (based on emotional primacy).

With the evolutionary support of the human organs of speech and hearing and a powerful central nervous system, language, as the result of goal-directed selection, develops ontogenetically by the activation of genetically inherited dispositions of a general nature, i.e., to perception and mental/physical action, conditioned by emotional evaluation and, linked to it, the growth of Self and socialization. Rational thought and symbolization have their origin in the logic of primordial emotional evaluation. Emotional and social conditions should be understood as an essential constituent of biopragnmatist philosophy.

Processual feedback, the crucial role of which has been demonstrated above for semiosis, applies, apparently, also to the evolution of the human central nervous system (cf. Lieberman 1984: 331). It appears reasonable to assume that there was not and could not be any simple, unidirectional evolu-
tion of symbolic thought and language from an initially developed human neocortex. This would contradict the principle of successive adaptation through selection, conditioned by evolutionary feedback (cf. Johansson 2005: 243ff.). Therefore, if we, conversely, maintain that the growth of the neocortex is the result primarily of the human language capacity, this would appear reasonable only if this capacity were subject to the same condition of successive evolution. But are we then at all entitled to speak of 'language capacity' at that point of evolution when, by the accident of mutation, human adaptation would be confronted with the possible choice of developing language and corresponding anatomical and neurobiological means? No, it appears necessary rather to view the very act of selection as the evolutionary trigger, viz., of the successive, parallel development of symbolic thought and further cognitive dispositions to linguistic semiosis, on the one hand, and of the organs of speech and hearing and the neocortex, on the other. That language originates in, or rather, that its embryonic preconditions start developing in a definite direction from, a mutation is natural since selection presupposes biological variation, and variation presupposes random mutations. As Givón (2002b: VIII; cf. also Lieberman 1984: 333; Donald 1991: 199ff., 366, 368) maintains, this cannot have been any "serendipitous mutation" that gave way for language to enter the scene as a ready-made 'organ', but rather an impetus to a long gradual evolution. Further, we probably have to assume a dynamic cooperation of different factors of variation possibly preconditioning language, viz., in anatomic design (as, for example, the shape of the supralaryngeal vocal tract, according to Lieberman, 1984: 330; for a rejection of this thesis, see Louis-Jean Boe et al., 2002), as well as perceptual-cognitive capacities based on sensorimotor functions. This understanding harmonizes with the assumptions of co-evolution and "gradual escalation" advanced in Malle (2002).

This is a simplification, naturally. We have to assume an increasing complexity of social behaviour – developing initially on the basis of prelinguistic, primarily emotional (emotional-iconic), iconic, and indexical semiosis (cf. Donald's evolutionary stage of 'mimetic culture'; Donald 1991: 177ff.) – to have played an important role in this process, as well. More specifically, we may understand dispositions to spatial and temporal analysis to have evolved as a cognitive capacity by way of symbolization starting from primitive indexical semiosis of things and events.

We may, accordingly, assume that language as such has no phylogeny, i.e., linguistic structure is not inherited genetically. Similarly (however trivial this statement may sound), language change cannot be a matter of phylogeny, either. It takes place only by way of socio-conventional activation ('cultural learning') and development in ontogeny, i.e., as a result primarily of abductive selection (and implied teleology) determined by non-linguistic (or prelinguistic) hereditary dispositions of a biopragmatic nature. Language change can, consequently, be explained adequately only on the basis of these
general genetic-regulative motives and cognitive capacities, which rule the ontogeny of language and carry in them the universal direction of language diachrony subsumed by the notion of teleology. Accordingly, teleology cannot be applied directly to historical change, because our explanations of the latter must by necessity start in the ontogeny of language. In other words, language change is the empirical evidence of selection processes in ontogeny and their implicit, genetically pre-programmed teleology. The crucial role in language change ascribed to abduction is derived, according to the proposed model, from its responsibility for selection. All change starts with and is monitored thus by abduction, primarily through selection.

Selection in the form of partitioning (discontinuation) is interpreted as the fundamental composite perceptual-sensory and cognitive strategy for the individuation (objectification) of things and events in chaos, assigned divisibility and continuity by biological (reticular) rhythmization. Subordinate to (but, by processual feedback, conditioning) perceptual-sensory part-whole relations are the cognitive part-whole relations represented by Gestalt/pattern matching perception, on the one hand, and the subordinate aspectual-temporal perspective of events in terms of totality vs. partiality, on the other. The latter distinction, in which we may have found the key to a solution of the classical philosophical problem of time, cooperates by way of processual feedback with change-of-state and cause-effect analysis in the perception and cognition of events, including action performed by the observer (see 3.13).

If it should turn out that these suggestions have brought us somewhat closer to revealing the 'secret' Peirce (CP 6.418) felt still to remain after his valiant attempt to bridge the gap, on the one hand, between space and time – understood by him as constituents of 'fundamental', i.e., physical, 'laws' – and their corresponding human concepts, on the other, the credit for this goes to him alone, for his incessantly inspiring, and challenging, guidance in the search for sense in human behaviour, including language:

[...] as that animal would have an immense advantage in the struggle for life whose mechanical conceptions did not break down in a novel situation [...], there would be a constant selection in favour of more and more correct ideas of these matters. Thus would be attained the knowledge of that fundamental law upon which all science rolls; namely, that forces depend upon relations of time, space, and mass. When this idea was once sufficiently clear, it would require no more than a comprehensible degree of genius to discover the exact nature of these relations. Such a hypothesis naturally suggests itself, but it must be admitted that it does not seem sufficient to account for the extraordinary accuracy with which these conceptions apply to the phenomena of Nature, and it is probable that there is some secret here which remains to be discovered.
The present reflections are carried out in a philosophical framework that I conceive of as biologically founded cognitive-pragmatic realism, or, simply, biopragmatism. Essential components of this project (besides the methodological/metacognitive tools of hierarchy, process, coherence, feedback, decomposition and binarism) are: fundamental biological motives; teleology implied by processes of selection throughout the entire hierarchy of semiosis; emotional evaluation as the origin of rational thought and symbolization; perceptual-abductive regulation of semiosis in mental/physical action; the growth of Self and socialization; perspectival variation realized permanently by abductive selection; the interface between phylogenetic dispositions to perception and mental/physical action, on the one hand, and their activation through 'cultural learning' in ontogeny, on the other.


The space/time model in outline (hypotheses of space/time cognition)

The framework of space/time processing is summarized here (cf. also Thelin 1999, 2002: 62ff.) in a model based on my observations above (see 2.2–3, 3.3, 3.9, 3.11–13; see also below, 4.2, 4.8, Ch. 8, especially 8.3–4). This model is understood to embed organically the specific component of temporal processing elaborated in terms of aspect (see 2.1–3, 3.8–13; see also 4.2, 4.8, Ch. 5, 8.3–4, Ch. 10), tense (see 2.1–3, 3.12; see also 4.2, 4.8, Ch. 7, 8.3–4, Ch. 9, Ch. 10), and taxis (see 4.2, 4.8, Ch. 9), and function, in turn, within the superordinate abductive model of perception and mental/physical action (see 3.2).

1. Spatial and temporal analysis of the world as immediately perceived chaos is enabled by biological rhythmization and the corresponding assignment to it of homogeneous divisibility and continuity. This procedure – and prerequisite for analysis by way of perceptual-sensory and cognitive partitioning/discontinuation – is thus the manifestation of an endogenous regulative motive (Trevarthen 1990a) underlying perception and mental/physical action. By means of the homogeneous rhythmical screen, attention and perception can, accordingly, be understood to be directed toward (potential) objects in the perceptual field.

2. Space is not a physical reality but rather a perceptual-cognitive construction originating in the analysis (discontinuation) of divisible continuity applied first to the extension of things (assumed to be primordial), and then – by way of METAPHOR I – to their distances: either constant distances or changing distances, traversed by moving things, i.e., their trajectories. By means of space, man thus establishes relations between things at rest and in motion.
3a. *Time* is not a physical reality but a perceptual-cognitive construction originating in the *analysis* (discontinuation) of divisible continuity applied to *motion*. By the reinterpretation of changing spatial distance as changing distance between old and new states (the prototypical temporal distinction before-after), divisible continuity – by way of METAPHOR II – is transferred from trajectories to motion itself. This may be assumed to come about in such a way that motion emerges, as a concept of divisible (phasal) and continuous *object*, from the conceptual amalgamation of a moving thing and its trajectory. The extension of time emerges as an abstraction of the extension of motion (see 3d below).

3b. *Time proper* is represented by the *analysis* (discontinuation) of motion by means of temporal-perspectival distinctions (aspect, tense, taxis), and, on this basis, the measurement of its extension (see 3d below) in terms of duration, as well as localizing references to the (standardized) extension of time in terms of dating.

3c. By subsequent *synthesis*, discontinuity is replaced by a new, heterogeneous continuity of temporally related instances of motion, i.e. events.

3d. Through non-discernment of the analysis preceding secondary, synthesized, continuity – i.e., by amalgamating the steps represented by 3a and 3b, under the influence of 3c – motion with its features of extension and divisible continuity (‘linearity’) is ascribed by the superficial METAPHOR III to time itself. By way of unconscious feedback projection, temporality – as evidenced by the conception of primordial continuous time (cf. Bergson and others) – is equally ascribed metaphorically to non-temporal continuity introduced by biological rhythmization. This projection becomes possible only by abstracting from the discontinuous nature of the temporal analysis of events, whether they are body-external or body-internal (see 1. above, and Section 3.11).

4. *Space* and *time*, accordingly, are analytic instruments by means of which man, from a given perspective, operates when perceiving and cognizing the world. Spatial and temporal (spatial/temporal) analysis is integrated in a complex process of perception and mental/physical action based on *change-of-state and cause-effect analysis*. The goal of this process is to keep control of life situations and, ultimately, ensure survival.

5. The derivation of time from space, illustrated by the emergence and further development of the before-after distinction (see 3a), is evidenced still more clearly by the compound spatial/temporal nature of the situational-perspectival *foreground-background* distinction and the event-perspectival *totality-partiality* distinction. The latter aspectual distinctions may be assumed to precede the before-after distinction hierarchically since events can be ordered only when ascribed to the foreground and, correspondingly, individuated by way of totalization (delimitation). In a pre-aspectual sense, totality is thus assumed to precondition primitive temporal measurement as well as ordering (see below, 8.3–4). The situational-perspectival distinction between *foreground* and *close background* is realized by the event-perspectival distinction between *totality* and *partiality*, respectively. Operating on divisible continuity, totalization and partialization function as topographic definitions of events and their relations to other events, prominently in terms of sequential order within the foreground (totality) or simultaneity of events of the close background (partiality) with events of the foreground.
4 Motion, time, and temporal metaphor in the light of the history of philosophy

While Chapter 1 outlined the general philosophical, i.e., epistemological, background for cognitive-linguistic studies, and more specifically prepared the ground for their biological and pragmatic foundation and application to studies of time (developed in Chapter 2 and Chapter 3), the present chapter is oriented toward a somewhat different objective. This is to confront empirically the theoretical assumptions emerging from the cognitive-linguistic analysis of time, above all the category of aspect, with a representative selection of proposals advanced within the special philosophy of time in the course of its long history. In view of its natural connection with the age-long illusion of ‘moving time’, a section on the metaphorical nature of time has been included as well.

4.1 The ‘enigma’ of time

Is there any single concept throughout the history of ideas – except, perhaps, existence itself – that has attracted students of nature, of man and society, of language, thought and belief, more than the concept of time? Apparently, not. This can probably not have to do only with its undoubtedly fundamental position in the overall system of concepts, or with its degree of abstraction as such.

What is it, then that has rendered the concept of time so problematic for philosophers, physicists, mathematicians, biologists, anthropologists, linguists, psychologists, historians of religions, and others? Why is it that just time (and not space) from the very beginning of reflective thought has been questioned as to its existence and its reality; or, contrarily, been made both the ultimate creative and destructive principle, the source of all – as in Vedic thought of the Maitri Upanisads (cf. Mandal 1968: 10, 15)?

To answer these questions one obviously has to consider carefully the origin of the concept of time itself and its cognitive-pragmatic functions in man’s analysis of situations, on the one hand, and the corresponding universal system of discourse construction and analysis, on the other.
Such an inquiry appears to prompt a first assumption, viz., that the perennial 'enigma' of time may be explained, in a rather straightforward way, by the insufficient attention paid to the functions of time in language. Accordingly, St. Augustine’s famous statement already at the close of the 4th century regarding the essence of time appears to be symptomatic of most reflections on this concept both before and after him: "If nobody asks me I know; if someone puts the question and I have to explain, I do not know any more" (Confessions XI: 14, 17; quoted after Ricoeur 1983: 22).

Proper considerations of linguistic functions (the only data on the matter accessible to us in a direct way) will now, as I shall attempt to demonstrate, help us explain at least in part this apparently evasive or, even, illusive character of time.

To begin with, already previous cognitive-semantic research (cf. Thelin 1990a, 1990b, 1991b, 1994) had actually succeeded in uncovering to some extent the concept of time, and found it to be a highly developed complex of different, though hierarchically-processually related, temporal distinctions. According to their hierarchical position, some of these distinctions are more abstract than others. These differences can be properly understood only if we regard time to be not only a matter of measure and localization, but also – and more importantly – a matter of perspective.

4.2 Time as perspective

With few exceptions perspectival meanings of time have been altogether neglected in traditional temporal studies to this day. This condition is paralleled by the circumstance that there have as a rule in the history of philosophy been only isolated observations indicating the significance of perspectival for a theory of knowledge. One remarkable exception from the past can be found in Indian philosophy, more specifically in the 'doctrine of relativity' developed by Jainism (cf. Frauwallner 1956: 261, 275). The perspectival 'pluralism' of Jainism appears also to be reflected in 'the four views' of the Indian grammarian Bhartrari discussed below. The exception par excellence in Western philosophy is, certainly, Nietzsche to whom will is will to power, manifested by the will to give a meaning to this world by interpretation, i.e., to control the world by interpreting it (Nietzsche 1964 [1887]: 323, 331–348). 'Theory of knowledge’ he wanted to replace by a theory of perspectival, by 'perspectivism' (p. 323): "Against positivism which sticks to phenomena ['there are only facts'] I would say: no, precisely facts there are not, only interpretations” (p. 337; my translation). Against idealism he said: "We have no categories at all that allow us to distinguish 'a world in itself' from 'a world as appearance'. All our rational categories have their origin in the senses."
However, almost 200 years before Nietzsche, Leibniz in his monadology (cf. Carr 1930: 99–100) had already introduced an explicitly perspectival understanding of perception within his idealistic theory of knowledge: "All these different universes are [...] only perspectives of one universe from the different viewpoints of each monad" (ibid.: 100).

A perspectival attitude we also find in Ortega y Gasset (1961 [1923]: 91ff.): "The persistent error that has hitherto been made is the supposition that reality possesses in itself, independently of the point of view from which it is observed, a physiognomy of its own [...] But reality happens to be, like a landscape, possessed of [an] infinite number of perspectives, all equally veracious and authentic. The sole false perspective is that which claims to be the only one there is."

The embryo of a corresponding perspectival understanding, applied to time, we find in the Indian national epos Ramayana (5th century B.C.). Accordingly, time (Kala) was differentiated as superhuman, irresistibly continuous time (Daiva), on the one hand, and time determined by the individual and brought into action by the will or deeds of particular human beings (Dis-ta), on the other (cf. Mandal 1968: 24ff.).

As pointed out by Robert Innis (1999: 538) in his illuminating treatment of Peirce and Polanyi, there is a "point of deep affinity" also between Nietzsche and Peirce in their adherence to the hermeneutic tradition. The latter never developed any theory of perspective, but there appears today to be an increasing awareness of the importance of perspectival differentiation within the general framework of Peircean semiotics, especially under the influence of field and Gestalt theory (cf. Anttila 1992: 62, 68).

If perspective, including temporal perspective, as I shall argue below (see also above, 3.2), is part of our perception and conceptualization of the world, and the latter are thus dictated to a definite extent by our individual will to control situations according to idiosyncratic experiences, emotions, values, interests, needs, expectations, intentions, preferences, and so forth – then this must have consequences for the adequacy of such notions as absolute values, truth, and, correspondingly, the traditional distinction between 'cognitive' acts (meanings) and 'non-cognitive' acts (meanings) of will, respectively. In this context I would believe it appropriate to consider also the important notion of 'knowledge-constitutive interests' suggested by Habermas (1968: 211). In the task of integrating perspective into functional-semiotic models of language and thought, modern cognitive-pragmatic science, in my view, faces one of its most serious challenges so far. We may expect an attempt to fulfil this task (without ending up in total value nihilism or radical scepticism) to help us see more clearly the implications of perspective for a theory of knowledge and, accordingly, for the traditional philosophical oppositions of idealism vs. realism and rationalism vs. empiricism.

The problematic nature of time seems to have to do, thus, not only with its fundamental cognitive-pragmatic role and its degree of abstraction as
such, but also – and in particular – with its underlying complexity. Besides
the functions of measure, localization, and periodicity fulfilled by various
meanings of chronological time, crucial functions of perspective, fulfilled by
 hierarchically superior meanings of time, appear to be at work as a device
for basic situation analysis and discourse organization, respectively.

The probably most important temporal-perspectival instrument of man’s
adaptation to new situations (and for ultimate survival) has, in fact, been of
little concern to traditional temporal research. This instrument, implemented
in language by the so-called aspect category or corresponding, often circum-
scriptive, means of expression, may thus be assumed to be part of our analy-
ysis/control and corresponding linguistic reproduction of situations by way of
discriminating and ordering events according to cause-effect (cf. Peirce W 1.
44, 92) in assigning to them change-of-state properties and corresponding
foreground or background roles, respectively (see 3.10, 3.13).

The cognitive distinctions realized by the usually manifest linguistic cate-
gory of tense alone have to a considerable extent figured in studies of time
from the very beginning. The true perspectival nature of tense was not al-
ways properly understood, however. Serious problems in this regard re-
main unsolved because the hierarchically superior category of aspect and
its interrelations with tense were usually not discerned.

That is the reason why St. Augustine (354-430 AD; in his Confessions,
quoted after Ricoeur 1983: 19ff.; see 8.2), for example, proceeding from his
understanding of time exclusively as measure, had to face the insurmounta-
able problem that extension (as a prerequisite for measurement) could be pos-
tulated only for past and future but not for present. Today we would say with
some certainty that this is a consequence of the aspectual feature of totality
(+TOTALITY), implied by the delimiting function of measuring events, and
the cognitive-pragmatic incompatibility of this feature with the meaning of
actual present as reference to events, viz., parts of events, perceived as coin-
ciding with the moment of speech (involving, inversely, the aspectual feature
of partiality, –TOTALITY; see 3.12).

In cases of events that are viewed as not taking place ‘in time’, i.e., not in
the chain of events constituting, by way of aspectual totalization, the fore-
ground, or, by way of aspectual partialization, the close background (cf.
Thelin 1990a; see 3.8) of situation/discourse, but are referred to the remote
background, as in cases of the habitual, generic, and ‘eternal’ meanings (as
well as in cases of events, lacking the phasal structure necessary for direct
totalization, such as stative events), no delimitation by totalization would
consequently be conceivable in past and future either. The actual present
meaning, however, by necessity presupposes the opposite of delimitation by
aspectual totalization, viz., reference merely to the one part or phase of an
event coinciding with the moment of speech. Truly stative events, since they
lack internal phasal structure, are not, naturally, susceptible, either directly
or indirectly, to such aspectual partialization (–TOTALITY) which is nor-
mally the close background perspective of ongoing process (see Thelin 1991b: 283ff.).

The latter condition is the simple explanation of one of the notorious problems of English grammar, viz., why verbs expressing true states do not as a rule take so-called continuous forms. As a consequence, the alternative grammatical term 'progressive tense' used for such forms can be dismissed as designating as tense what, in reality, is aspect. Likewise, the condition that aspectual totality (+TOTALITY) is incompatible with the actual present meaning explains why simple forms of English verbs cannot as a rule express in this tense one of their two basic perspectival meanings, viz., the one of viewing events as taking place 'in time', i.e., in the foreground of situation/discourse by way of aspectual totalization, but only the one of viewing events as not taking place 'in time', i.e., in the remote background of habitual, iterative and generic meanings, 'eternal truths', etc. (For well-defined exceptions to this rule, see Thelin 1990a: 34, 54–60.)

It is remarkable that recent developments in linguistics and philosophy of language – despite Wittgenstein's (1958, §§ 109–111; 1960a: 3.323ff.) serious criticism (anticipated, in fact, by Nietzsche; cf. Heller 1992: 215) – has not yet led to the full recognition of what is indeed the air that language breathes: polysemy. Temporal semantics is no exception in this respect, and the above example of polysemy in English simple forms, usually not understood by traditional grammar (see also below), indicates a general picture: a field of research still dominated to a great extent by superficial inductivism (morphologism) and the serious confusion of verb semantics and temporal semantics, on the one hand, and of distinct temporal meanings, on the other. In the latter case this holds for the distinction between time as measure and perspective, respectively, but also for the distinction between different kinds of perspective. The confusion of aspect and tense is still rather wide-spread, although the category of aspect was outlined in essence (and distinguished from verb semantics) by the Swedish Slavist Sigurd Agrell already at the beginning of the 20th century (Agrell 1908; cf. Thelin 1990a: 36, 56ff.).

Otto Jespersen's (1924: 275–289) account of time and tense implied a further step toward a semantically founded distinction between tense and aspect. However, the lack of developed cognitive-pragmatic assumptions about the perspectival nature of aspect prevented him from distinguishing more clearly aspect semantics from verb semantics ('Aktionsarten') and discovering their true interdependences (pp. 286-289). For example, he suggests an analysis of the distinction between English simple forms and the so-called continuous (‘expanded’) forms (answering to my distinction +TOTALITY vs. –TOTALITY in time-related events) in terms of "relative duration" (p. 278; his example: "He was raising his hand to strike her, when he stopped short"). As a consequence of this durational approach, Jespersen is not in a position to found theoretically the distinction between simple forms in the above time-related (+TOTALITY) use, on the one hand, and their non-time-
related use in cases of permanence and habituality, on the other (p. 279; his example: "He lives in London" as opposed to "He is staying at the Savoy Hotel"). Concomitant with the durational approach is Jespersen’s idea of "time-limit" (or "time-frame") which he, in contrast to my proposal of partial perspective, applies to continuous forms. In ascribing, accordingly, to simple forms the opposite feature of "no time-limit" (p. 279), he can possibly account only for cases of non-time-relatedness, whereas this feature is clearly contradicted by simple forms expressing time-relatedness and representing, according to himself, "the [relatively] shorter time" (p. 278; his example: "He was writing when I entered"). It is evident that such contradictions disappear when we apply instead the distinction of total vs. partial perspective on time-related events. "Time-limit", or, more properly, aspectual totalization of events, in the present theory pertains, on the contrary, merely to simple forms, and does so only when they express these events in the time-related perspective of foreground. In contrast, Jespersen’s observations of aspect functions in narration, although not without forerunners (p. 276), especially his "tempo-distinction between the aorist and the imperfect" (p. 287), are more apt to be integrated in subsequent aspectual research in terms of grounding (see 8.4.10.3).

The postulation of a third temporal category, viz. taxis (cf. Thelin 1991a), has made it possible to understand better, for example, the problematic system of 'perfect' meanings (present perfect, pluperfect, future perfect), viz., as based on the traditional feature of anteriority of an additional, subordinate set of perspectival distinctions (+/-ANTERIOR, +/-POSTERIOR) not pertaining to either of the categories of aspect and tense (the traditional issue) but operating in cases of compound events on aspect (mediately) and tense (immediately) in a hierarchical-processual fashion (see below, Ch. 9).

The cognitive-semantic hierarchy of the three temporal-perspectival categories of aspect, tense, and taxis is thus rather transparent: all events without exception are aspectualized (directly or indirectly); all events are differentiated as to tense (if this is an option in the language under consideration) unless aspectualized as not taking place 'in time' (viz., beginning from a certain degree of temporal abstraction; cf., e.g., 'eternal present'); only in compound event structures do events undergo taxis if hierarchically subordinate to already tensed events, i.e., they are viewed as preceding (as is the case in the 'perfect' system), succeeding (as is the case in, e.g., English, French or Bulgarian past future), or simultaneous (cf., e.g., the Russian so-called comitative 'Aktionsart') with the latter.

The distinction between time as measure and perspective, respectively, has consequences for the traditional issue whether time is absolute or relative. As regards the temporal-perspectival meanings, it is evident that they are relative in essence, and are so in two distinct, but interrelated ways: (1) a structural-logical one: taxis is dependent on tense; tense is dependent on aspect; aspect is dependent (by implication) on situation analysis; (2) a sub-
jective-interpretational one: the outcome on all three levels of temporal perspectivization and situation analysis are dependent on individual variations as to the observers’ amount of shared knowledge, on individual emotions, values, interests, needs, expectations, intentions, preferences and so forth, and on actual perception (the latter dependent, in turn, on the previous factors in a processual feedback fashion).

Regarding time as measure, Newtonian absolute time was replaced by Einsteinian relative time as dependent on the observer’s motion, that is, time and space are interdependent, for example, in the sense that time (if not abstracted) is relative to a local point of view. For a more comprehensive discussion, see 3.12.

4.3 The spatial origin of time, and Bhartrari’s ‘four views’

This brings us to the pivotal question of how time and space do relate in the logic of human situation analysis as part of action/interaction (including discourse). It seems to be a well-founded hypothesis that time (both as measure and perspective) has its cognitive-genetic origin in the perception of space, or, more exactly, of instances of matter and their distances in space. Changes of these distances by the motion of matter (things) and the appearance of new states, as a result of the observer’s comparing the velocity of equivalent changes, assumedly imply the basis for a concept of time as the parallel (temporal) abstraction of changing spatial distance, i.e., as the extension of motion between old and new states (for a detailed analysis, see above, 2.3, 3.16). Such an observed extension is thus originally relative and perspective-dependent as is spatial distance. Exact measurements of distance and temporal extension, i.e., duration, in ‘absolute’ terms of length and chronological time, respectively, represent a secondary development that has continued up to this day by way of successive refinements and appears to be of subordinate interest to a philosophy of time (see 8.3).

According to one hypothesis (cf. Thelin 1990b; see 8.4.3) it was precisely duration and its implicit meaning of delimitation as means of temporal quantification that became, as it developed, the prototype of the aspeutal concept of totality as means of temporal qualification. This development, restricted – as we have seen – to events in the past, presumably brought about a clearer cognitive distinction also between the latter meaning and the meaning of the present, thus creating the basis for subsequent tense distinctions. This, in turn, led to the conceptualization of the only possible aspeutal perspective of the (actual) present, i.e., the prototype of the partial perspective (–TOTALITY) as opposed to the total perspective (+TOTALITY) of events in the past. The extrapolation of the partial perspective (as the view of ongoing
process) to the past as well is known to be a later development (cf. the history of the Indo-European imperfect). The extension of the distinction +/-TOTALITY to future time presumably was made possible much later by the development of the future tense meaning from modal meanings (cf. Thelin 1978a: 25ff.).

The suggestion to treat the basic aspectual distinction (in time-related events, i.e., in the foreground and close background) by the equipollent distinction +/-TOTALITY (cf. Thelin 1978a and subsequent works on aspectology) is in accord not only with the findings of Gestalt psychology (although its notions of ‘parts’ and ‘wholes’ were usually applied to situational/discourse foreground and background, respectively, as equivalent to ‘figure’ and ‘ground’; see the detailed discussion in 3.8), of perception psychology, psycholinguistics, and social psychology, but also with interpretations of aspect in terms of the count-mass distinction (for references, see Thelin 1990a: 32).

The Indian grammarian Bhartrari (5th century) made some pertinent observations in his analysis of the relations between language, thought, and reality (referred to below on the basis of Houben 1995: 390–422). In the Sambandhasamudessa (‘Chapter on relation’) of his work Vakyapaddiya he made the following statement (in karika 52): “Verbal usage follows (only) one aspect of a part (of reality); or (it follows) an ascertainment through an external factor; or a reversal (of reality); or something non-existent.” In the oldest available Sanskrit commentary, Helaraja, the grammarian, speaks of the four views: (1) the ‘aspect-of-a-part’ view, (2) the ‘ascertainment-through-external-factor’ view, (3) the ‘reversal’ view, and (4) the ‘non-existence’ view.

These different views have been understood to refer to different schools, but Helaraja’s interpretation shows a considerable overlap, and it appears reasonable to assume that they may also all belong to one set of equally relevant cognitive features emphasized differently according to the actual school. As a consequence of the important perspectival implications of these features, Helaraja’s comments – although they refer mainly to things – allow of an interesting application of the four views to event structure, as well:

1. The ‘aspect-of-a-part’ view may be identified with the perceptual-cognitive analysis of reality by the strategy of subjecting chaos to homogeneous segmentation (divisibility) and, consequently, continuity (compare the wave-particle duality in physics; cf. Bohr 1958: 89ff.). That this is a superordinate ‘partial view’ (distinct from –TOTALITY and akin rather to Bergson’s concept of partiality as ‘preperspectivizing’ device; cf. Thelin 1990b: 116ff, 2002: 21ff., 29ff.; see above, 3.8–9, and below) is evident from Helaraja’s ascribing bundles of elements to this kind of ‘part’. Further, such ‘parts’ are not expressed in their completeness but only in one aspect. The latter aspect could then, I suggest, be the way the established segment of ‘reality’ is interpreted according to the two subsequent views (2) and (3), whereas view (4), the ‘non-
existence’ view, as we shall see, should rather be assumed to be hierarchically superordinate to them all – although there appears to be some overlap with view (1).

2. The ‘ascertainment-through-external-factor’ view is consistent with the aspectral partial view (–TOTALITY) of events, i.e., of segments of the continuous ‘reality’, established by the preperspectival operation of (1). The aspectral partial view (–TOTALITY) implies the actualization – through the external factor of the moment of speech (in the present) or of some other point of reference (in the past or future) – of one part or phase of an event as simultaneous with the point of reference (the aspectral meaning of an ongoing process).

3. The ‘reversal’ view should apparently be understood absolutely (as appears to be intended by the addition ‘of reality’ in the original), but Helaraja’s comments allow also of its relative interpretation, i.e., as the reversal of (2). ‘Reversal’ (viparyaya), according to Helaraja, “consists in the division by various limiting factors.” Since delimitation of events in my understanding is precisely the basic function of totalization, it appears reasonable to identify view (3) with the aspectral total view (+TOTALITY). This suggestion receives support in Helaraja’s reference to the definition of view (3) by the Consciousness-school: “[T]he appearance of the opposite (viparitakhyati) is that something which is without outer form appears with an outer form.” Delimitation of events through aspectral totalization is thus an important instrument for their discrimination and ordering according to situation analysis in terms of change-of-state and cause-effect (see 3.9 and below). Delimitation through totalization, accordingly, is a prerequisite also for sequencing in narrative and the corresponding advancement of the plot (cf. Thelin 1990b: 107; see 8.4.4).

4. The ‘non-existence’ view may be understood to be hierarchically superordinate to the preceding three views, which represent preperspectivization (a), and perspectivization through partialization (b) or totalization (c), respectively. To understand these three views, preparing for and assigning to events an aspectral analysis, ‘localizing them in time’, as realizations of superordinate ‘non-existence’ might appear strange until we take a closer look at Helaraja’s further comments on the distinction between existence and non-existence. This is a distinction made in the first place between Brahman, the formless entirety of Existence or pure consciousness, on the one hand, and language usage, on the other, as expressing imperfect knowledge (impure cognition) and superimposing form upon the former by way of dichotomizing conceptualization (this distinction can be traced back to the Upanisads, as shown in Mandal 1968: 14, 16, 21; for a parallel in Greek Pre-Socratic philosophy and Plato, see below). Existence, or ‘the ultimate reality’, which is consciousness, has a completely undivided nature, whereas its counterpart, non-existence, brings about the ways of ‘the relative world’ on account of imperfect knowledge. Cause-effect relations are thus considered to be non-existent by an argument that introduces temporal distinctions, viz., between the present, on the one hand, and the past and future, on the other: there is existence if reality appears as identical with the outside, having the present as a ‘limiting factor’, and thus is ‘causally efficient’; there is non-existence, however, if reality has the past and future as
'limiting factors’ because then it is a matter of inner 'subtle impressions’ and not the object of the outer senses, and there is no 'causal efficiency’ common to all valid knowers either. This view is apparently modified by Helaraja who would not entirely exclude existence because it is remembered (in the past) or anticipated (in the future); that is, cause-effect relations might accordingly exist objectively also in the past and future. However, because of the contradictions which are thought to emerge from the cause as existing thing and the effect as existing hypothetically either before, simultaneously with, or even after the cause (since in the latter case this would be the origination of something non-existent), cause-effect is dismissed altogether as non-existent (karika 62).

For our discussion it is important to note that if cause-effect is referred above to non-existence as artificial and devoid of external causal efficiency "common to all valid knowers”, this to us means nothing more nor less than it is subject to individual perspectival variation. Even though the distinction existence vs. non-existence in Indian philosophy in its underlying assumptions may appear alien to cognitive-pragmatic theory, the way it is explicated demonstrates its unquestionable relevance to our understanding of the perception and cognition of motion and time. The reality of Brahman is sequenceless: "[T]here is the appearance of division, effected by 'imperfect knowledge’ […] and the appearance of sequence effected by the capacity of independence called time […] The one reality, unbounded and not limited […] appears to have sequence by superimposing a 'before’ and 'after’ in space and time” (Houben 1995: 420). According to Balslev (1983: 103–105), there have been different views among scholars as to the metaphysical status ascribed to time by Bhartrari (Balslev refers also to the Kalasamuddesa, 'Chapter on time’ of his Vakyapadiya). My interpretation above, based on the fundamental cognitive relations indicated by Bhartrari (in their explication by Helaraja), gives preference to the view that "the power called time (Kalasakti)” would be "the inscrutable quasi-positive principle which makes the one appear as many, the unchanging and unchangeable as undergoing mutation” (ibid.: 105).

Helaraja’s argument for non-existence as Bhartrari’s view (4) involves conditions of distinct cognitive levels, however, which lead to a certain overlap with view (1), the 'aspect-of-a-part’ view. The latter can still be understood, I believe, as the subordinate specification of non-existence (in the sense explicated here), viz., as homogeneous, divisible continuity preparing for subsequent sequencing (and correlation) of events by way of the heterogeneous segmentation implied by their time-related aspectedual analysis, that is, as localized in the foreground or close background of situation/discourse. The circumstance that the counterpart, existence (according to the same explication), includes meanings not reconcilable with sequencing (or definite temporal correlation) but pertaining rather to the permanency of abstract,
idealized background knowledge (‘pure consciousness’), consistent rather with the non-time-related aspectual analysis of events, that is, as localized in the remote background, also speaks in favour of this hierarchization.

As it will turn out (see 4.7), there is a striking parallel here to the way the transformation of continuity can be related consistently to Peirce’s trichotomy of universal categories. Accordingly, Peirce’s Firstness may thus be understood to be reflected by the opposite of Bhartrari’s view (4), which is Thirdness as implemented by (1). The further implementation, according to Bhartrari’s views (2) and (3), represents Peirce’s Secondness.

If Bhartrari’s four views (as interpreted here on the basis of Helaraja’s explication) can be applied with some feasibility not only to things but to events, as well, this would support the idea that perspective, especially in terms of Gestalt wholes and parts, pertains both to matter and motion (cf. Thelin 1990b: 105; see above, 3.8). This idea appears to be strengthened further by the hypothetical derivation of time from bodily-spatial extension by way of metaphoric transformation, ascribing bodily-spatial features to motion, as well, including divisibility (see 3.16, 4.4).

4.4 The metaphorical nature of time

One of the decisive mechanisms of linguistic semiotics implied by the general notion of polysemy is metaphor. In view of the latter’s significance for language structure, in a diachronic as well as synchronic respect, it is remarkable that metaphor in temporal expressions has attracted so little attention. One important exception is Lakoff and Johnson (1980: 7–9, 42–44, 65ff.; for general remarks, see also Smart 1949, Hermerén 1991: 23ff.). One possible reason for this neglect is that we often are not aware of these metaphorical functions in the same way we may be in various, rather overt types of what we loosely may call ‘superficial’ metaphor. This latter kind, to be sure, we can also see applied to the concept of time (cf. tooth of time, Father Time, time is money). However, in these and similar cases, too, the semantic transfer may differ in transparency according to its diachrony (and our actual knowledge). One such kind of metaphor and of some interest to this discussion is represented by expressions of events caused by a perceptual illusion, such as, for example, those improperly ascribing motion to the sun and not to the earth (cf. sunrise, sunset). The possibility of a metaphorical function in these or similar expressions appeared only as a consequence of new knowledge (here: in the 16th century) and the continued, conventional use of such expressions (given that the language users share this knowledge).

As to other expressions involving time, however, metaphorical functions do not appear to be conventional in the above ‘superficial’ sense; cf., e.g., course of time. There is no knowledge here about the outer world as such that – if retrieved – would unequivocally unveil them to be metaphors. This
would hold also in cases where a 'superficial' metaphor is introduced sec-
ondarily, as in flow of time, river of time, by adding the image of water to the
basic image of motion. Metaphorical functions suggesting time’s motion are
therefore to be looked for as part of hierarchically ordered processes at a
considerable cognitive depth. Here one may see the realization of one of the
hidden strategies of least effort, ultimately responsible for the logical struc-
ture of linguistic sign transformation. As the means of what we might call
'logical convenience', metaphors of such cognitive depth may therefore ob-
scure primitive perceptual-cognitive conditions and their underlying 'genetic
code' – very much like Lakoff’s (1987: 154) "metaphorical cognitive mod-
els" operating, according to him, on more basic "structural (propositional
and image-schematic) cognitive models."

The important thing, however, is that thought processes – even when ob-
scured – may be assumed generally to be structured metaphorically accord-
ing to the economy principle, i.e., realized by polysemy and the correspond-
ing strategy of interpreting one kind of experiential data by analogy with
another. This assumption was argued convincingly by Lakoff and Johnson
(1980) in their important work on metaphor. Now, when they apply this gen-
eral principle to the concept of time, they do so (as indicated, for example,
by the above reference to propositional structure) only on cognitive levels
answering to 'superficial' metaphors, as in the case of time is money (ibid.:
7–9). This becomes evident further as they (pp. 42–44) ascribe to time, and
correctly so, another function of metaphor, viz., that of moving object, but do
not observe the (relatively) deeper metaphorical function of moving time
itself. A further study of time and its perspectival functions, as attempted
here, appears, however, to confirm in substance the validity of Lakoff and
Johnson’s general principle by establishing the metaphorical nature of time
on much deeper cognitive levels, viz., in its very origin of bodily-spatial
extension (see 3.16). These findings are thus in agreement with and support
Lakoff and Johnson’s important idea of metaphorical coherence (pp. 87–96)
and a corresponding thoroughgoing system linking experience (including
perception) to thought in an overall model of action (p. 180ff.).

As was shown above (3.16) and will be discussed below (4.6.4.1 and
4.6.4.2: Excursus III), I therefore believe it legitimate to assume that at the
cognitive core of time there are – also in the synchronic (or ontogenetic)
semiotic system – fundamental spatial distinctions regarding such notions as
extension of matter, distances between instances of matter (things), and mo-
tion changing these distances. The expansion (by metaphor) of features of
spatial distance (extension, divisibility and continuity) to motion via the
trajectory of moving things, and the reinterpretation of changes of distance
between things as changes from old states of affairs to new ones, were the
steps that hypothetically conditioned the genesis of time and its reverse su-
perimposition and application as analytical (discontinuous) instrument to
motion in a hierarchical feedback system of cognitive processing. On these
assumptions we are in a better position to understand with some probability
the proper cognitive-hierarchical status of the metaphor of ‘moving time’. It
might accordingly be the result of the confusion of motion, analyzed by time
as events, and time itself, assumedly under the influence of the subsequent
synthesis that establishes a new, heterogeneous continuity of temporally
related instances of motion, i.e., events (see 3.16).

Now, processing complex cognitive structures involving metaphor may
on logical grounds be supposed to obey the general economy principle – as
long as proper situation analysis and communication are not endangered.
This principle apparently implies not only an optimal hierarchical order of
transformation (by interpretational choices) but also the skipping or automa-
tization of certain steps of transformation (and, possibly, the alternative use
of a corresponding neural shortcut). The result would be that distinct cogni-
tive levels sometimes are collapsed and ascribed features in common that in
a more explicit analysis – if necessary – would be apprehended as belonging
to distinct hierarchies. This condition appears to be related to what Lakoff
(1987: 268, 283) refers to as abstraction “by metaphorical mapping” (see
4.6.4.2: Excursus III).

Due to the cognitive depth of certain metaphorical functions in temporal
expressions we usually become aware of them only on some reflection or
more extensive deductive thought. That is why they, in fact, have become a
cause of theoretical-methodological dispute with bearing on the issue of
reality, as well. Is it, for example, a matter of ‘reality’ when we (as demon-
strated above) ascribe to time the quality of motion (cf. As time goes by)?

And if so, what kind of ‘reality’ is it then? If time is understood to be either a
measure of or a perspective on events, how can we reconcile a device for
measure or perspective that moves with the motion of events operated upon?

It is my understanding that the classical issues of time studies to a great
extent were born out of the non-discernment of the metaphor, ascribing mo-
tion to time rather than time to motion. The circumstance that this simple
cause has been obscured by its far-reaching consequences for our apprehen-
sion of ‘reality’ can easily – perhaps even trivially – be illustrated by the
way a sundial works. The measurement of time – the partition of the day’s
duration according to conventionally chosen positions of the sun, and the
sundial’s peg indicating the latter’s actual position by its shadow – is stable,
without motion. The shadow of the peg (or hand of a clock by way of substi-
tution) moves as the earth moves. To say now about the shadow of the peg
that it has moved independently is basically as illogical as it would be about
the shadow of a human being – unless for some good reason it may be con-
venient to deviate from this condition by a metaphor, saying that time has
moved (rather than that things have).

Now, since time is basically ‘shadows of events’, and shadows cannot as
a rule be perceived independently, there can be no perception of time with-
out perception of events either (as there can be no perception of space or
distance without perception of matter). Accordingly, if time and space exist only as a result of perception (in a cognition-dependent sense, including inference by memory, prognosis, imagination, etc.), they always require perceiving subjects. To imagine a world of events without observers is possible, though, but only as an abstraction of the world actually perceived. The temporal structures of this abstract world would carry the basic perspectival properties predicted by human perception (and its underlying cognitive pre-conditions) in the world of actual experience. This would hold also for the metaphorical conception of absolute ‘moving time’ and corresponding illusions like reversibility of time, time travel, etc.

By neglecting the metaphor of ‘moving time’ or, rather, which is equally crucial, not discerning its true hierarchical-cognitive status, traditional temporal studies have thus of necessity confused features of time and motion (events), respectively. As a consequence, they have encountered insurmountable problems in attempting to define time in terms of events and not the other way around, which would follow from the functions of time as a measure of and perspective on events. This is, I believe, the decisive point where philosophy of time went wrong. Instead of treating motion, i.e., events and the course of events (situations and their change-of-state structure) as basic (cf. Kamp 1979: 391; Thelin 1994: 263ff.), one ascribed to time this basic role and assigned to it features of motion. However, there remained, apparently, an intuitive irresolution and vacillation in the field of force between the two. That seems to be the reason why there have been endless discussions of whether time has a beginning and/or end, is dense/continuous or discrete/discontinuous, is linear, has a direction, is reversible, has points and/or periods (intervals), etc. According to the above remarks it would appear that such questions concern the possible structure of events rather than time as measure and perspective on events.

The infelicitous fusion of events and time, caused by the superficial metaphor of ‘moving time’, and the resulting directional system of representation symbolized by arrows in, for example, Koschmieder’s related temporal conception of Richtungsbezug (Koschmieder 1929, 1934: 235ff., 1987: 62ff.), led to the disregard of time’s constructive, perceptual-cognitive function of perspective on events (see 3.8–12, 3.16, 4.5 and Ch. 7). However, this was precisely the theoretical basis of Hewson and Bubenik’s (1997: 1–23, 351–364) attempt to describe tense and aspect in the Indo-European languages. The non-discernment of time’s metaphorical motion and its fusion with events were reflected by their central tools of description: ‘Descending Time’ (“the downward flow of experiential time”) and ‘Ascending Time’ (“the upward progression of time”). Further problematic consequences here of this traditional oversight were, to mention some of them: the acceptance of physics’ absolute time, viz., ‘Universe Time’ (“a vast present running to an infinity in the past and to an infinity in the future”); the corresponding idea that there is “time that is outside the mind, just as there is space outside
the body”; the aspectual treatment of the meanings of future time and the perfect system (see Ch. 9).

4.5 McTaggart, Prior, and the metaphor of ’moving time’

It is symptomatic that the metaphor of ’moving time’ from the Pre-Socratics on has had such a devastating influence on theories of time. Modern temporal logic is no exception. ’Motion of time’ and the corresponding neglect of the moment of speech as the decisive point of departure for perspectival functions of tense have thus in many cases led tense logic and model-theories of time into an impasse of serious complications and contradictions. Crucial to a proper understanding of this development is McTaggart’s (1908, 1927, 1934) famous argument for the unreality of time and, especially, the extensive discussion that was provoked by his radical conclusion.

Prior’s (1967) analysis of McTaggart’s argument can be said to have had great impact on subsequent tense logic. Let us therefore pay special attention to his way of reasoning. To begin with, Prior accepts McTaggart’s conceptual framework as representing ”the phenomenology of time” and ascribes to it (in agreement with Findlay 1968 [1941]) the essence of a tense logic. He cannot, however, accept ”the outrageousness of [McTaggart’s] conclusion, and the fallaciousness of the reasoning which leads up to it.” The thesis to be argued here is that Prior, by basically adopting McTaggart’s hypothetical concept of time, adopts also the metaphor of ’moving time’. He is not willing, however, to accept the logical consequences of this idea, viz., the unreality of time. In other words, if Prior cannot accept the unreality of time, he should not be able to accept the idea of ’moving time’ as premise either – given that McTaggart’s proof is deemed to be valid.

The idea of ’moving time’ actually originates in Plato’s view of time as the ’moving image of eternity’; further, in a misinterpretation of Aristotle’s (Physics 220a: 4; see 4.6.6) ”time made continuous by the ’now’”, and St. Augustine’s ’three-time-theory’ based on the notion of ’present image’ (cf. Thelin 1990b: 95ff.).

McTaggart’s argument goes as follows. In terms of ’positions in time’ he introduces hypothetically two types of temporal distinctions, viz., (1) ’earlier-later’ (cf. Aristotle's 'before-after’) and (2) past-present-future. The former positions (the so-called B-series) are permanent, the latter (the A-series) are not. Tense positions are thus assigned motion: ”the movement of time consists in the fact […] that presentness passes to later and later terms.” The underlying metaphorical nature of this definition (for a similar observation, see Hermerén 1991: 24) – not discerned by McTaggart – clearly comes into sight in his corresponding view of ”taking the A-series as sliding along a
fixed B-series.” The conventionalized metaphor of the passage of time as applied here – not without a certain vacillation, though – to McTaggart’s hypothesis of tense can be illustrated by his example of the death of Queen Anne: “It was once an event in the far future. It became every moment an event in the nearer future. At last it was present. Then it became past, and will always remain past, though every moment it becomes further past” (McTaggart 1927: §§ 306, 311).

The above formulations seem to indicate the movement of an event along permanent tense positions. However, whether time is conceived to move, or singular events are conceived to move along tense positions, motion in both cases (cf. Lakoff and Johnson 1980: 42–43) is an illusion caused by the neglect of a single stable point of judgement (the moment of speech). Parallel to this illusion is the familiar phenomenon that, sitting in one of two trains at the same platform, you often cannot decide which one suddenly moves until you find a stable point of reference for your judgement outside the trains. That is, without a stable point of judgement (the moment of speech) you may either (if you are moving at the same speed as the observed things) ascribe rest to things that are moving, or, in other cases, motion to things that are not moving. The latter is precisely what you do if you allow for things to move, i.e., singular events to take place, in the future, the present, and the past, viz., by viewing them from a gliding point of judgement (represented by McTaggart’s “presentness [passing] to later and later terms”). However, in a theory of time does it make sense, really, to speak of a past event (like Queen Anne’s death) as having been a future event before 1536 and backward to the ‘beginning of time’ (if there were such a thing)?

McTaggart’s following step (ibid.) is to state that the distinction ‘earlier : later’ of the B-series can indeed be replaced by the distinctions of the A-series: ”The term P is earlier than the term Q if it is ever past while Q is present, or present while Q is future.” That the meanings of past, present, and future here differ from those based on a relation to moment of speech does not occur to McTaggart. It is an irony of fate that precisely the hypothetical temporal distinction of the B-series, thus dismissed by McTaggart as superfluous, has turned out to be the very foundation of the independent temporal category of taxis operating on tense, proposed here to handle, among other things, the traditionally problematic system of perfect meanings (see 4.2 and Ch. 9). Moreover, this analysis of the meanings of the perfect invalidates them as an argument used by Prior (1967) against the sound analysis of tenses proposed by Russell (1903: 471ff.).

Having dismissed the B-series, McTaggart turns to the A-series and presents his arguments against its reality. His purpose is thus to demonstrate that the theory of tense underlying the A-series, and consequently – in his view – the concept of time itself, is contradictory in essence. His first objection regards the contradiction between the necessary mutual exclusivity of tense distinctions, on the one hand, and their coexistence in events (“every
event has them all”), on the other. After my previous discussion it should be
evident to the reader that this contradiction is a consequence of McTaggart’s
tacit application of points of judgement of two contrary kinds: in the first
case – a stable one (by intuition), in the second one – a gliding one (by pre-
conception). However, McTaggart removes this contradiction by saying (ad
hoc) that the existence of tenses is not simultaneous but successive.

He then goes on to explain the meanings of tenses, and does so correctly
by applying intuitively a stable point of judgement. However, this is only an
intermediary step serving as a base for his further explication: ”that [M] is
present, will be past, and has been future […] means that M is present at a
moment of present time, past at some moment of future time, and future at
some moment of past time.” Here he applies the gliding point of judgement,
but – and this is crucial – not consistently. Prior (1967: 5) recognized the
significance of the meaning of ‘is’ in the two cases quoted, but he failed to
grasp these meanings. Contrary to Prior’s assumption it is the first ’is’ that is
‘non-temporal’ (i.e., not related to stable tense). The second ’is’ is ambigu-
ous, since it, indeed, amalgamates McTaggart’s apparent intuition of the
stable tense meaning of the present (due to moment of speech) with his pre-
conception of ‘moving time’ with respect to the other tenses.

This unconscious fusion of two distinct cognitive procedures is signalled
already by his ’a moment’ in the former case, and ’some moment’ in the
latter, and becomes overt in his following assertions (McTaggart: ibid.): “If
M is present, there is no moment of past time at which it is past. But the
moments of future time, in which it is past, are equally moments of past
time, in which it cannot be past.” In his first assertion, where McTaggart
relies on his intuition of stable tense, he states implicitly that ’gliding tense’
for a present event does not work in the past. In his second assertion, where
he relies on his preconception of ’gliding tense’, however, he states that it
works for the same event as past in the future, although it should not accord-
ing to his first assertion. From this very contradiction, logically derived from
the hidden metaphor of ’moving time’ in the shape of ’gliding tense’ and its
confusion with the intuition of ’stable tense’, McTaggart concludes that time
is unreal.

To Prior this conclusion ”seems perverse” because he does not discern its
premises which he implicitly had accepted himself. Consequently, his at-
tempt to argue against McTaggart’s basically correct reasoning (though
based on false premises) is doomed to fail. Captive to the same unconscious
confusion of ’stable’ and ’gliding’ tense (as was McTaggart), he repeats his
earlier mistake with regard to the temporal vs. non-temporal nature of the
copula ’is’. Accordingly, his main argument – the inconsistency he wants to
see in McTaggart’s reasoning in this respect – is a construction based on his
inability to discover where McTaggart refers to ’gliding tense’ or (intuitive-
ly) to ’stable tense’.
Exactly the above distinction, though implicitly, was made in Smart’s important attempt to give a Russellian analysis of tensed sentences, i.e., based on the stable point of judgement represented by one utterance (the moment of speech). Smart demonstrated convincingly that the analysis based on what is uncovered here as ‘gliding tense’ and represented by the example ‘The beginning of the war was future, is present, will be past’, presupposes different utterances: “This shows how utterly unlike ‘this event was future and became past’ is to ‘this light was red and became green’” (Smart 1949).

After Prior’s treatment of McTaggart we are entitled to expect similar objections to Smart’s proposals. Indeed, Prior (1967: 10ff.) is unable to realize that Smart’s distinction between the two types of tensed sentences, based on a singular utterance (the moment of speech), on the one hand, and different presumed utterances, on the other, represents two different conceptions of temporal perspective, viz., ‘stable tense’ and ‘gliding tense’, respectively. Ignorant of this distinction, Prior applies Smart’s analysis of the first type of sentences (cf. ‘[a boat] was upstream, is level, and will be downstream’) to that of the second one (see above) and comes up with the sentence ‘Occasions on which the beginning of the war is future are earlier than this utterance, the occasion on which it is present is simultaneous with this utterance, and occasions on which it is past are later than this utterance’ whose temporal relations according to him are based on one utterance. In reality, this sentence is ambiguous (as was ‘is’ above) and can be understood also as based on different utterances (moments of speech) according to whether you apply the ‘stable’ or ‘gliding’ tense perspective, respectively. ‘Occasions’ can be understood then as ‘occasions on which it would make sense to say’, for example, ‘that the war is past’. Then it is a matter rather of relating presumptive past and future utterances to a present utterance. However, a corresponding unrestricted analysis ‘occasions on which it would make sense to say that the war is future’ is problematic on cognitive-pragmatic considerations and thus (as indicated above) as to its significance for a theory of tense – and of time.

This ambiguity holds also for Smart’s equation of his second example with ‘The war was going to begin, is now beginning, and will have begun’. It is important therefore that we are aware of the fact that this sentence can either be analytical in a metalinguistic sense and then expresses the conception of ‘gliding tense’ (with different utterances), or it represents (at least with regard to present and future) linguistic propositions (with a singular utterance). This distinction is decisive because in the first case the past and future events (attached to presumed utterances) relate to the present event on an equal basis, i.e., as simple events, from any past or future moment pointing to the present event. In the second case (of ‘stable tense’), however, the past and future events are governed by the present event (attached to a singular utterance) as compound events, the hierarchically superior event of which points from a specific past or future moment not to the present event but to
an inferior (embedded) event at some later or earlier moment not specified. The attentive reader must have realized that these compound temporal meanings are the past future and future perfect, respectively.

Precisely the latter compound ‘tenses’ (in reality, tense-taxis meanings) are what Prior (1967: 10ff.) adduces as his grand finale argument against Smart’s and Russell’s conception of ‘stable tense’: “The real moral of Smart’s paper is that the Russellian analysis of tenses breaks down, as so many false theories in this area break down, as soon as we remember that there is such a tense as the future perfect.” The question is whose theory breaks down after all. It turns out that Prior’s disqualification of a tense analysis based on the concept of utterance (the moment of speech) is founded on his own postulating such utterances where there are none to be found. By tacitly applying his preconception of ‘gliding tense’ to linguistic propositions and, accordingly, forcing upon them utterances beyond the only possible one, he believes himself to have proved the inadequacy of a ‘stable tense’ theory. His proof takes the form of a question: “How are we to analyse, for example, ‘Eventually all speech will have come to an end’?” His answer is: “What Smart’s recipe would give is ‘The end of all utterances is earlier than some utterance later than this one’, which translates something empirically possible into a self-contradiction.”

That this contradiction is not due to Smart’s analysis but rather to Prior’s misconception of ‘gliding tense’ is evident. No linguist would seriously maintain that the meaning of the future perfect implies more than one utterance (the moment of speech), but Prior’s implicit suggestion is that there should be no utterance at all in the cognitive essence of tense. His postulating a contradiction in the analysis of the above example, viz., that – as a consequence of an utterance-based tense theory – something would be uttered after the last utterance, can thus be refuted as groundless. Russell’s basically sound tense conception so far remains unchallenged, whereas Priororean tense logic appears to be based on serious shortcomings due to its failure to recognize the metaphor of ‘moving time’. For a further development of this critical discussion in the light of an elaborate perspectival theory of time, including interrelations with causality, see below, Ch. 7.

The epochal significance of McTaggart’s argument is thus not that it has proved that time is unreal, as he believed, but rather that one of the two temporal concepts he chose as premises, viz., the one of ‘moving time’ (the so-called A-series), leads to contradictions if treated as the cognitive essence of tense (and time). It is important, however, that in this connection McTaggart raises the question of reality. Although no one has ever seen time move, we would not question that there exists a conception of ‘moving time’ and that this conception exercises an influence on our reception of ourselves and the ‘outer’ world.

This existence of a conception of ‘moving time’ can, I suggest, be related to ‘reality’ in at least two ways. First, as the observer’s subjective-perspec-
tival relation to changes in the ‘inner’ and ‘outer’ world; second, as the subordinate relation of this conception – in the same observer’s cognitive processing of such changes – to the fundamental conception of ‘stable time’. We may thus in both cases theoretically ascribe to time cognitive reality and – which is crucial – do so on hierarchically distinct levels (see 3.16).

Only recent developments toward cognitive-procedural models of linguistic functions (anticipated, in fact, by Charles S. Peirce’s theory of signs; see 3.2, and Ch. 5) have furnished the necessary tools for a proper hierarchization of distinctions in complex perceptual-cognitive structures (cf. Thelin 1985, 2002; see Ch. 3). The secondary, metaphorical derivation of ‘moving time’ from the superordinate conception of ‘stable time’ is one instructive example. It thus has bearing not only on the issue whether time is real or unreal, but also – due to the decisive role played by time in man’s practical and intellectual orientation in literally every situation of life – on the traditional philosophical oppositions of idealism vs. realism and rationalism vs. empiricism. I believe it indispensable, therefore, to re-examine critically certain central features of the historical treatment of motion and time, and explore more closely their significance for a theory of knowledge.

4.6 Motion and time in the history of philosophy

4.6.1 Heraclitus

Heraclitus, the Ephesian (about 500 B.C.), has been credited with the famous assertion that ‘everything flows’ (panta rei). Whether this is historically correct or not is disputed. However, two features of the world observed by Heraclitus were essential: constancy of change and the dynamic equilibrium of oppositions. The latter feature can be viewed, indeed, to have laid the grounds for Platonic and Hegelian dialectics and in some sense anticipated modern cognitive binarism – according to Roman Jakobson and his followers, the very foundation of linguistic semiotics.

Excursus I: On distinctive features in hierarchical-processual models

Prototype semantics (cf., e.g., Lakoff 1987) can be considered to be a natural reaction to the traditional, static practice of distinctive feature analysis. Within hierarchical-processual cognitive models of language, however, the matter appears to stand differently. Improved by new approaches to markedness (cf., e.g., the principle of additive, or ‘cumulative’, markedness; Thelin 1987: 101–108; see Ch. 10), binary feature analysis seems to give more explicit answers to the questions justly posed by prototype semantics and cor-
responding suggestions like, for example, Lakoff’s (1987) in itself constructive theory of ‘idealized cognitive models’.

The whole problem appears to be one of commensurability. How can we imagine symbolic structure to be processed without decomposition? The question is indeed how to reconcile decomposition with flexible ‘en bloc’ strategies understood to be based on prototypes and corresponding "basic-level primacy", including Gestalt perception (cf. Lakoff 1987: 13). Do the latter necessarily exclude feature analysis (ibid.: 46ff.)? Would it not be conceivable that there exist alternative strategies according to the actually necessary degree of accuracy of analysis, still based on one primary strategy (as common denominator), viz., the one of distinctive feature analysis, but – if possible – simplified in definite ways? For one thing, the principle of (processually) cumulative markedness allows of a more explicit general-to-specific hierarchy of concepts and cognitive features. The interesting thing is how we process such hierarchies. How do we manage to avoid running through all the choices we need to make? If there were, ‘in the middle’ of a general-to-specific hierarchy, a ‘basic level’, and we would enter the hierarchy of complex symbolic structure (ibid.: 1, 284) at this level, guided by Gestalt perception, this could hypothetically take place from a parallel simplified symbolic structure attained first and with little effort; but how could this transition from one structure to another be possible without commensurability of the means of identification (for a pertinent discussion, see Arnheim 1969: 171–178)? Further, it has not been shown that the important distinction foreground vs. background (figure-ground; see 3.8) cannot be handled by distinctive features but only by ‘idealized cognitive models’ (Lakoff 1987: 133). The latter idea is not supported by my analysis of temporal perspective as part of situation analysis in terms of change-of-state and cause-effect (see 3.13). Finally, are there at all (if we exclude levels of ultimate generalizations) any cognitive-pragmatic conditions (including presuppositional background) that cannot be subjected to decomposition into binary distinctions?

A feasible solution to the problem along these lines might, accordingly, be founded on classical Gestalt theory (see 3.8), more specifically as applied in the principle of ‘joint apprehension’, derived and further developed by Polanyi from Köhler’s ‘segregated wholes’. It is to Robert Innis’ (1999) credit to have pointed to and adequately estimated the significance of Polanyi’s corresponding distinction between focal and subsidiary awareness. Perception – and cognition – would under these conditions be based on a combination of focus on wholes and simultaneous reliance on constituent particulars (cf. Chafe’s distinction between focal and peripheral consciousness; Chafe 1994). Such an understanding (similar to my conception of ‘variable decomposition’, suggested in Thelin 1985: 160) would be equally reconcilable with the holistic idea of open (‘vague’) schemata, on the one hand, and the decompositional idea of permanent access to hierarchical-
coherent feature structure, on the other. The direction of research, aiming thus at handling in a dynamic fashion both pattern matching and structural change, appears to me most promising and may, as suggested by Innis, indeed allow us to “develop a powerful and differentiated model of meaning.”

* 

There is another interesting point in the fragmentary legacy of Heraclitus that appears to have evaded the attention of students so far. It has to do with the well-known assertion about our not stepping into the same river twice (cf. also 3.12). Usually Heraclitus’ statement has been quoted after Plato’s *Theaitetus*: “You cannot step twice into the same river; for fresh waters are ever flowing in upon you.” This is, apparently, a simplified interpretation of Heraclitus’ assertion that seizes only upon one of the two features mentioned above, viz., *change*. This tendency is reflected also by Plato’s ascribing (in the same dialogue) to Heraclitus the view “nothing really is, but all things are becoming.” The original text, as far as I can see, rather emphasizes the feature of *contrariety*: “We step and do not step into the same rivers []; we are and we are not”.

The inference of change from the second, negated, clause “do not step” is reasonable, but how are we to understand the first, assertive, clause – and the opposition it forms with the negated one? Logically, if the river we step into is the same, there can be no change implied. This makes sense only if the opposition at hand represents two distinct perspectives, namely temporal perspectives, from which the river (and the action of stepping into it) is viewed: in the negative clause, the river is seen as time-related (viz., as close background related to the foregrounded course of events), i.e., as something moving at the moment we step into it; in the positive clause, as non-time-related (viz., related to the remote background of habitual, iterative, generic, etc., events), i.e., as something immobile, with constant properties of identity whenever we step into it. If this analysis is correct, and I believe it to be, it would mean that *Heraclitus in his famous assertion intuitively combined his fundamental feature of change with a cognitive-semantic opposition of a fundamentally temporal-perspectival nature*, viz., the aspектual distinction between foreground and close background, on the one hand, and remote background, on the other, representing, accordingly, change and non-change, respectively.

In a corresponding way “we are and we are not” could – in order to make sense – be understood to represent the opposition between ‘being’ as a permanent, i.e., remote background state, on the one hand, and a close background, or foreground-embedded, state subjected/susceptible to foreground change, on the other; cf. ‘Mary lives in Paris’ vs. ‘Mary is living in Rome this spring’. This appears to be at least one feasible, linguistically relevant, case reconcilable with Heraclitus’ superior idea of change (‘becoming’ /
‘perishing’) according to which stable states (‘being’) apparently would be possible only within his general ‘flow’, viz., as representing perceptual-cognitive strategies including temporal-perspectival manipulation of ‘reality’. Verbs expressing states (see 4.2) subjected to volitional control, like ‘live’ (= ‘dwell’), constitute one type of exception that permits ‘continuous forms’ as an expression of the partial aspectual perspective (–TOTALITY), viz., when applied indirectly to states (themselves without phasal structure) as part of the close background or, as here, foreground embedding (see 3.12–13, Ch. 10), related to the (potentially) changing foreground.

It is important therefore to realize that Heraclitus reconciled in a dialectical way his method of binary decomposition (cf. Kant’s Zergliederung der Begriffe; Kant 1899 [1787]: 47) with the idea of a unified, harmonic cognitive process. Embedded in this superior, changing One, a possible feature is thus non-change (as demonstrated above for cases of the aspectual feature of remote background). Heraclitus, in fact, within this One refers to an equivalent opposition, viz., LOGOS vs. ETERNITY. Through language we may arrive at LOGOS, the cognitive foundation of change and time as opposed to non-change and ETERNITY. According to modern aspectology, eternity is just one – albeit the most abstract – meaning of (remote) situational background.

The hierarchical-processual understanding of change/non-change and time sketched above on the basis of binary oppositions creates, I hold, the necessary observational distance for an independent, critical discussion of the classical controversy about ‘being’ (constancy) vs. ‘becoming’ / ‘perishing’ (change). By underestimating Heraclitus’ principle of oppositions (as Plato did) we would attribute to him a principle of change that in itself becomes contradictory. From a perceptual-cognitive (and logical) point of view it does not seem reasonable, therefore, that change could be apprehended without its opposite – constancy. Without the idea of including such an opposition as subordinate to the changing overall system of cognitive processing we end up, indeed, with contradictions. This is why Benjamin (1968: 9) presumes that ”Heraclitus did not realize that in adopting a principle of change (strife) he had unconsciously inserted a basic constancy into his system; for the law of change cannot itself change.”

For one thing, we may have to make a distinction here between the idea of an ever-changing ‘outer’ and ‘inner’ world, including our perceptual-cognitive processing of these worlds, on the one hand, and the possible inherent structure of the device performing the latter, on the other. In the former case we might, with Heraclitus, have to assume continuous change (of some kind; for a possible explanation, see further below); in the latter – the possibility not only of change but also of non-change, for example, in the shape of perceptual-cognitive distinctions constitutive of perspective-dependent situation analysis (cf. Thelin 1990a; see 3.12). The traditional
notions of *motion* and *rest*, accordingly, obviously should be distinguished from immediately perspective-dependent *change* and *non-change*, respectively. The former, referred to here as *phasality vs. non-phasality*, are still assumed to be mediately perspective-dependent (see below, 5.7). From this distinction it should be evident when I refer below to change in the immediately perspective-dependent sense or in the general (only mediately perspective-dependent) sense equivalent, according to my interpretation, to (merely preperspectivized) homogeneous segmentation, i.e., divisible or phasal, continuity.

The above interpretation might be understood such that phasality (of *motion*, activities) inherent in nature is actualized only when interpreted temporally-perspectivally as involving change. Non-phasality (of *rest*, states) inherent in nature may, accordingly, be interpreted temporally-perspectivally as subject to change (indirectly or potentially) as a result of actualized phasality – and change – in surrounding situations. The suggested analysis implies an application of Aristotle’s distinction between *potentiality* and *actuality* that demonstrates its range of effect by way of processual feedback all the way from the level of temporal-perspectival discontinuation to the level of primary perception (see 4.6.2, 4.6.4.1; cf. also 3.13, 5.7). This interpretation explains how it is possible that what to someone appears to be a state-changing foreground event may appear to someone else to be just part of a (close background) process related directly to the foreground but not qualifying for a new state of affairs; or, it may even be viewed rather as a remote background condition related merely indirectly to the foreground. Correspondingly, what to someone appears to be a remote background condition may – in spite of the non-phasality of the situation – be ascribed change (potential change) by perspectival inference from other (preceding, parallel or expected) phasal situations interpreted as implying a change-of-state.

This discussion appears to indicate that Heraclitus’ idea of a superordinate, continuous change should rather be understood as an idea of continuous cosmic motion without a counterpart of continuous rest, and thus of questionable perceptual-cognitive status. The notions of *motion* and *rest* could therefore for the sake of clarity be replaced by the notions of phasality and non-phasality, respectively, governed, according to the present theory, by biological rhythmization (in attention and perception; see 3.3, 3.8, 3.11) and the corresponding assignment of homogeneous divisibility to chaos, viz., in interaction with nature-inherent phasality-non-phasality. Apprehension of change and non-change is then based on the temporal-perspectival analysis of such divisible continuity, i.e., phasality – as opposed to indivisible continuity, i.e., non-phasality – and the human perceptual-cognitive strategies for its discontinuation by partitioning (see 3.8).

There is thus, in this interpretation, a certain kinship with Bergson’s (1889) distinction between *temps réel* (*durée-qualité*), on the one hand, and
"temps [...] materialisé, devenu quantité par un développement dans l'espace", on the other. According to Bergson (1911b: 18), it is by reducing (his former) superordinate continuity "to an arrangement [...] of parts" – i.e., on my interpretation, rather to the phasal structure implied by homogeneously segmented, divisible continuity – that 'time is materialized' , i.e., that, according to the same interpretation, the proper preconditions are created for the subsequent analysis-by-construction of situations and their events with the aid of discontinuous temporal-perspectival distinctions in intimate cooperation with change-of-state and cause-effect analysis. It is understandable that Bergson – unaware of the particular perspectival functions of time – did not distinguish between motion and change and applied his idea of ‘materialization’ inconsistently – now to time, now to change. It also remains unclear, under the circumstances, which perceptual-cognitive status should be ascribed to his superordinate continuity (durée-qualité), as it was with regard also to Heraclitus’ superordinate change. It is more likely, however, that we have to do here – in both cases – with an unconscious feedback projection of temporal continuity onto primordial non-temporal continuity (effected by biological rhythmization), viz., by abstracting from the discontinuous temporal analysis of events (body-external or body-internal) and their heterogeneously continuous organization only through subsequent synthesis (see 3.16), than with an assumed inheritance of phasal continuity in underlying chaos, understood normally to be amorphous.

However, by speaking of segmentation as "partial views" of the continuous whole rather than parts, Bergson (ibid.: 32) shows his deep understanding of perceptual-cognitive mechanisms and appears to suggest, indeed, the idea of perspectival (or, rather, preperspectival) operations. As it turns out, the cognitive preconditions for perception of motion must, in fact, be assumed (see 3.16) to be created only by underlying metaphors assigning bodily extension and divisible continuity to space and spatial distances. Motion or, rather, phasality would, accordingly, come into being only as a result of divisibility in changing spatial distances reinterpreted as situational distances, and the subsequent amalgamation of these distances, traversed by things, i.e., as trajectories, with things themselves, into continuous phasal, viz., analyzable objects. Such phasality, in turn, is the precondition for temporal-perspectival analysis, measurement (in terms of duration), and localization of events, and fulfils the function of preperspectivization (see 4.6.4.3, 4.6.7 and 4.6.8: Excursus IV).

4.6.2 The Eleatics

The Eleatic view was opposite to the one held by Heraclitus. Xenophanes (6th century B.C.), who maintained that man, captive as he is to his ‘opinions’, can never find the truth or know that he has found it, declared
that the One is without motion. Indeed, his divine and immobile One did not
know either motion or rest.

Parmenides (beginning of the 5th century B.C.) developed Xenophanes’
idea but replaced his teacher’s agnosticism by his important distinction be-
tween the real, unchanging One and the unreal, changing Many, dependent
on ‘opinion’ and our senses. The former, according to Parmenides, is acces-
sible by reason to true knowledge. Consequently, he held that change and
time, as distinguished from the non-change and eternity of the One, can be
proved to be unreal by the contradictions they cause (see 4.3). It did not oc-
cur to him (as it later did not to McTaggart, Prior, and others) that these con-
tradictions – and his corresponding conclusion – could be derived not from
the fact that change and time, indeed, are based on ‘opinion’ (involving per-
spective) but from the false premise of secondary temporal metaphor, ascrib-
ing to time features pertaining rather to unperspectivized motion: infinite
extension, divisibility and continuity (linearity). This is the very background
(see 3.16) for the erroneous denial of change and time by the Eleatics includ-
ing the so-called paradoxes of Zeno (see 3.12, 4.6.4).

However, Parmenides’ argumentation for the unreality of change and time
was based, first of all, on his absolute conception of ‘being’. According to
him, change (‘becoming’ / ’perishing’) would imply that something can both
be and not be, or that something can come to be out of nothing. These con-
tradictions have subsequently, in the light of empirical evidence, been con-
sidered paradoxical and either refuted as based on false premises or reinter-
preted as suggesting rather non-change of the substance of things as a pre-
requisite for the possibly changing properties of the latter. The paradox can-
not be resolved, though, until we realize that Parmenides (like many of his
successors) based his absolute ‘being’ on the failure to discern its polysemy
and thus seized only upon its existential meaning. This becomes evident
from Aristotle’s proposal to reconcile non-change and change by treating the
latter as the actualization of its potential existence. On the basis of his dis-
tinction potential vs. actual (real) existence Aristotle (Physics, 186a: 22),
indeed, criticizes Parmenides for supposing ‘being’ to have only one mean-
ing. Now, Aristotle’s distinction might perhaps (if we disregard here the
problem of duration) work in cases of qualitative and quantitative changes,
viz., as pertaining to existing properties of things, but not really in cases of
changes of things in space.

By not distinguishing the existential meaning of ‘being’ from its relation-
al meaning, implied by spatial changes, Parmenides erroneously denied on
existential grounds the reality of motion and, accordingly, change and time.
Aristotle, without grasping entirely the relational-perspectival meaning of
change and time (cf. also the discussion of Aristotle below, 4.6.4.1), de-
serves credit for having introduced thus by his distinction dynamis (potentia)
vs. energeia (actus) two distinct views on change that in fact may be reflect-
ed also in a modern system of aspect oppositions, more specifically, as per-
taining to the opposition non-time-relatedness vs. time-relatedness, respectively, expressed by the differentiated perspectives of remote background, on the one hand, and foreground and close background, on the other (cf. Thelin 1990a; see 3.12). The opposition time-relatedness vs. non-time-relatedness (indeed an abstraction) will be used below as a convenient notion comprising the underlying change-of-state conditions and corresponding foreground-background functions.

It is remarkable, but in view of these observations not really surprising, that Aristotle in his criticism of the view that reality is one (cf. Physics 185b: 25) even adduces an example bearing precisely upon this aspectual distinction: "The problem of the one and the many continued to worry even the more recent of the older thinkers, who protested against letting the same thing become one and many […] Some even proposed recasting ordinary expressions like […] the man is walking (badizon estin) into such forms as […] the man walks (badizei); they feared that […] they would present one as being many – as if one or being had but a single meaning!" The correspondence of the distinct Greek expressions to the English translations with their overt aspectual distinction (viz., between, on the one hand, time-relatedness and ongoing process, and, on the other, non-time-relatedness) is accidental and does not represent any clear-cut temporal-perspectival correlation. The interesting correlation pertains to a deeper level: Aristotle criticizes the one-sided existential understanding of 'being' which causes some to avoid the combination of 'is' with 'walking' because they would not "[let] the same thing become one and many […]". In other words, one would not allow for an absolute, non-changing 'is' (of unitary existence) to combine with an expression of change and the manifold of temporal relativity like the present participle of the verb. By not recognizing the polysemy of 'being', one ignored for dogmatic reasons not only its relative meaning but also the latter's reconcilability with time-relatedness, and the corresponding aspectual distinction between perspectives of time-relatedness vs. non-time-relatedness, as well. In regard to this basic distinction, Aristotle's standpoint that 'being' has different meanings and that reality is not one can thus be said to have perspectival implications. The time-related meaning of 'being' was evidently implied by the partial (–TOTALITY), aspectual meaning of ongoing process expressed by periphrastics with the present participle as they were frequently used in New Testament Greek, especially with the imperfect of the auxiliary (cf. en didaskon 'was teaching'). In this function they were opposed to the aorist and offered (hypothetically) a time-related alternative to the polysemous imperfect charged with the non-time-related meanings of habituality and iterativity as well. These matters still await their coherent exploration.
4.6.3 Protagoras’ *homo mensura* principle

The foregoing perspectival interpretation of Heraclitus can be said to find support in Protagoras’ (appr. 485–415 B.C.) denial of the absolute One and, in particular, his corresponding so-called *homo mensura* principle according to which ’man is the measure of things, of what is that it is, of what is not that it is not’. According to Peirce (W. 1.391), Protagoras ”made the manifold experience the only reality” (compare Lakoff’s ’experiential realism’; Lakoff 1987). However, Peirce (CP 6.349) also maintained that ”If man is the measure of things, as Protagoras said, then there is no complete [my emphasis] reality; but being there certainly is, even then.”

Excursus II: Peirce on the difference between existence and reality

The latter assertion was made by Peirce in a context where he wanted to explain the difference between reality and existence. His reasoning is not entirely transparent, but he concludes: ”There can be no uncertainty or ambiguity about existence […]; reality, however, […] is not altogether certain. Existence, then, is a special mode of reality, which, whatever other characteristics it possesses, has that of being absolutely determinate. Reality, in its turn, is a special mode of being, the characteristics of which is that things that are real are whatever they really are, independently of any assertion about them.”

The tenor appears to be that, as distinguished from existence (’being’), reality, although one, allows for a manifold of interpretations. Now, how are we to understand that ”existence […] is a special mode of reality” and ”Reality […] is a special mode of being”? If existence and reality are two different entities, and that is what is suggested, must not the reciprocal relation suggested by Peirce, as a result of his reasoning, imply a definite cognitive hierarchy between the two? What if we combine them and speak of ’real existence’? Does it not appear then that existence, too, is subject to interpretation (like Kant’s unknowable ’Ding an sich’)? This is, in fact, what I suggested above by my change-of-state/aspectual treatment of Heraclitus’ distinction ’being’ vs. ’non-being’ (’becoming’ / ’perishing’). If we combine the two concepts the other way round and speak of ’existent reality’, we would obtain thus a notion that refers in a meta-cognitive manner to the one and only (true) reality assumed by Peirce to underlie the manifold of interpretations. But according to Peirce’s reasoning the existence of such a reality could not be ”altogether certain”.

Should we stick then to the traditional view that reality and existence are more or less identical? No, Peirce seems to be making a point here. The dilemma of circularity that appears to question the intuitive difference between existence and reality could, I believe, be removed by clarifying explicitly the hierarchical relations involved. First of all, it should not escape our attention
thus that the two notions 'real existence' and 'existent reality' may be said to
represent answers to different questions, viz., pertaining in the first case to
the content of ordinary propositions, in the second case rather to that of met-
aphysical propositions. That is apparently why we apprehend the first notion
as more 'natural' than the other. Speakers are more accustomed to predicate
reality (rather than truth) about existence, and thus modify it, rather than the
other way around. Our concern below is how existence and reality might
relate in a model simulating man's perception, cognition, and linguistic re-
production of events.

I would for this purpose, in the following reinterpretation, proceed from
the notion of knowledge and suggest a corresponding cognitive hierarchy
ascribing to existence the superior status: (I) Something either exists or not
according to shared knowledge (experience); (II) Something is real to every-
body if it exists according to shared knowledge; (III) Something is either real
to someone, if it exists, or not real, if it does not exist, according to individu-
al knowledge.

By individual knowledge I understand idiosyncratic experience, emotions,
values, needs, interests (cf. Habermas 1968: 211), 'opinions', belief, inten-
tions, expectations, fantasy, etc. – all factors leading to a specific perspec-
tive.

According to this analysis, 'real' then always means 'real to someone'
everybody or somebody; II, III), whereas 'existence' is 'just existence' (I),
unless the question of reality is actualized by predicating reality (non-reality)
about existence: 'To him God exists' (= 'To him God is real' = 'To him God
really exists'). Accordingly, we react differently to the assertions 'There is a
God' (III) and 'There is a sun' (I). Saying 'To everybody the sun exists' (II)
is to assert (tautologically) the sun's existence as a fact generally agreed
upon, whereas saying 'To him the sun exists' is ambiguous in respect to the
sun's existence as a fact of general knowledge, but not with respect to reali-
ty.

The above reinterpretation thus deviates from Peirce's basically 'external'
understanding of existence as Secondness and treats it rather as factuality, in
a general and (hierarchically dependent) individual sense, like reality
'internally' applicable also to Firstness and Thirdness (see 4.7 and Ch. 5). As
distinguished from Peirce's basically absolute reality, reality is understood
here rather as a notion of value interdependent with the notion of factuality
(in agreement with the fact-value symbiosis suggested in Putnam 1981). In
cases of shared knowledge (general agreement, acceptance), existence/fact-
uality and reality – or their opposites – are equally predictable; in cases of
individual knowledge they are not.

One of the notorious problems of traditional aspectology caused by inter-
relations of shared knowledge and individual perspectivization, respectively,
was treated superficially as 'aspect competition' (Russian: konkurencija
vidov) as if perspectival variation were a matter of accidental competition between aspect *forms* (cf. Thelin 1978a: 102ff).

The hierarchy of cognitive relations proposed above, apparently, also reflects to some extent the foundations of the subtle mechanism of imagination and fiction. Moreover, it can probably be said to offer substance for the philosophical position according to which there is no absolute reality (or truth) or any absolute ’being’ (see 1.4). As clarified here by the role of perspective (in a broader sense), this view is based on the assumption that there can be no absolute knowledge. In the light of the role of perspective demonstrated by language we may assume that thinking and its base of knowledge / experience, memory, and actual situation analysis are characterized not only by collective conventionality but also by considerable individuality (see 4.6.8: Excursus IV, and 4.8). Disagreement on the reality of objects – or their features – implies disagreement on the existence of such objects. Existence (’that’) and reality (’that’ _and_ ’how’) apparently can be correlated logically only by means of their hierarchical-processual (feedback) interdependence in a coherent model of abduction sensitive to individual perspective (see 1.4 and 3.2).

There are no situations as such. Every situation is the result of its organization through interpretation and selection from a specific point of view and its implicit background of experience (in a broad sense). Therefore, point of view is primarily individual but may be shared to a greater or lesser extent by a group of individual observers on the basis of shared knowledge / experience. It is important that the assessment of situations in terms of their perspectival organization is thus understood to be dependent on personal decisions (see the quotation from Ortega y Gasset in 4.2). In a context consistent with such socio-psychological ’pluralism’, like Popper’s _open society_, functions of perspectival differentiation are pivotal: ”The reason why all description is selective is […] the infinite wealth and variety of possible aspects of the facts of the world […] a point of view is inevitable; and the naive attempt to avoid it can only lead to self-deception, and to the uncritical application of an unconscious point of view” (Popper 1966a: 261).

### 4.6.4 The paradoxes of Zeno

It is certainly not by coincidence that it was in commenting on the paradoxes of Zeno (495–445 B.C.) that Peirce in his Lowell Lecture II (W 1.390; see further below) uttered his view that ”an error is never a thing to avert our eyes from; but something in which is reflected the inverted image of the truth.” It could not have been said more to the point. The cognitive depth of the fallacies underlying Zeno’s paradoxes have – since Aristotle’s first comments – never ceased to challenge generations of philosophers. It appears there is still – after almost two and a half millennia – something important to be learnt from them. This is so much more the case as it can seri-
ously be questioned whether they have ever received any satisfactory solution. Let me at this point just state that the attraction of the paradoxes for logicians to this day bear witness to the fundamental epistemological role played by the oppositions on which they are based, viz., unity vs. manifold and rest vs. motion.

The following critical and necessarily selective survey of some comments on Zeno in the history of philosophy proceeds from the thesis sketched above, viz., that the oppositions just mentioned are not (in a general sense) mutually exclusive, but – in a hierarchical manner – mutually inclusive. The contradictions and the consequent denial of change and time as the most discussed aspect of the paradoxes (originating in Zeno’s support of Parmenides’ denial of the manifold) are based on the false premise of a secondary temporal metaphor, ascribing to change and time – as entities related to perspectivized motion – properties pertaining rather to unperspectivized motion, viz., infinite extension and divisible continuity (linearity); see 3.16, 4.6.1–2).

Zeno’s reasoning goes as follows: since motion requires states of motion, this implies the manifold in the shape of infinite divisibility of space and time; since this (as shown by the paradoxes) leads to contradictions, manifold, motion, and time cannot exist. But our objection must be that exactly as unity and manifold can coexist hierarchically, so can motion and rest. Motion is represented here by unperspectivized (or, rather, preperspectivized) homogeneously segmented, i.e., infinitely divisible, continuity; rest – by the stable instrument for subsequent heterogeneous segmentation (analysis) through perspectival manipulation of the former. It is the confusion of these two hierarchically distinct levels that of necessity leads to contradictions. The significance of this hierarchical distinction is reflected in a way by Russell’s statement (1903: 346–353; cf. also Peirce, CP 5.333) that “infinite-simals are an attempt to extend to the [constant] values of a [continuous] variable the variability which belongs to it alone.” Instead of drawing on this insight for a theory of time based on cognitive hierarchy, Russell remains bound by his idea that the solution can be found on the sole level of continuity. In order to remove the contradictions of continuity and discontinuity on one level he therefore refers to the arithmetical continuum and Cantor’s theory of transfinite numbers but does not show how the latter can ultimately solve the problem.

The erroneous infinite division of change (in terms of space traversed) and time (in terms of instants) leads thus to the contradictions of Achilles never catching up with the tortoise and of the ever-resting arrow, respectively. No theory of change and time can come to grips with these paradoxes unless it can show them to be the result of amalgamating two distinct cognitive levels, viz., the level of unperspectivized continuous (i.e., homogeneously segmented, merely preperspectivized) motion, on the one hand, and the level of motion made discontinuous by the stable instrument of perspectival analysis, on the other. Only the latter implies the discrimination and – after syn-
thesis — ordering of instances of motion (events) according to change-of-
state and cause-effect analysis. That the factor of perspective could be in-
volved in the contradictions of Zeno’s paradoxes was, indeed, indicated by
Plato (cf. Wedberg 1982: 52ff.) but only in regard to the opposition unity vs.
manifold. The distinction made by Plato can, however, be understood as the
general Gestalt one between a total and partial perspective, respectively (see
3.8).

4.6.4.1 Aristotle on Zeno
Let us turn now to the primary source of our knowledge of Zeno’s paradox-
es: Aristotle (384–322 B.C.). It may be said at the very outset that – as far as
I can judge – a feasible solution to them, overlooked by a great number of
scholars (with the possible exception of Henri Bergson; see below, 4.6.4.2)
has been waiting to be discovered in his comments all this time. The only
thing needed was, apparently, the light shed on Aristotle’s arguments by the
idea of temporal perspective.

It thus turns out that Aristotle’s distinction of potentiality (dynamis) vs.
actuality (energeia) can also be applied successfully to the contradiction
between continuity and infinite divisibility of space and time, on the one
hand, and the fact that a distance can be traversed in a finite time, on the
other. Aristotle (Physics, 263a: 23, 30) maintains that parts (and boundaries)
of space and time in cases of continuity are potential until they are actualized
and continuity and infinity thereby removed. Under these conditions the first
apparent contradiction between continuity and divisibility disappears. The
actualization of parts of space and time, rendering a distance traversable in a
finite time, according to Aristotle, takes place when we count (measure)
them. If we apply here the idea of time as perspective rather than measure
(although the latter also may depend on perspective; see 4.2) we are in a
position to understand the divisibility of continuous motion as potentiality
(corresponding to the preliminary, preperspectival homogeneous segmenta-
tion founded on biological rhythmization, and in accord also with Bergson;
see 3.11, 3.13, 4.6.1, 5.7), and the ‘counting’ of segments (parts) as their
subsequent actualization through temporal-perspectival analysis (besides
their measurement), according to my proposal above.

The only thing that might at first glance disturb this interpretation is that
Aristotle occasionally confuses motion and time (but who does not?). His
basically consistent hierarchical-cognitive understanding is clear, however,
from his definition of time as ‘an attribute of movement’ (ibid.: 223a: 16),
more specifically, as ‘the number of movement’ (ibid.: 220a: 24). He also
says (ibid.: 219b: 2): ”Time is not change […] but that in respect of which
change is numerable.” This perspectival reinterpretation of Aristotle’s basi-
cally relational conception of time is also reconcilable with his characteriz-
ing the procedure of counting as mental: ”[W]ould there be time if there
were no soul? If there could not be something to do the counting there would
be nothing that was countable, and therefore there would be no number: for number [... ] is either that which has been or that which can be counted. Thus if nothing but soul can count, there cannot without soul be number, but only the substratum of number, i.e. motion” (ibid.: 223b: 21). Since Aristotle did not discern the true perspectival nature of time (possibly, except for tense) or the perspective-dependent status of change (according to my suggestion), he did not confront the latter with motion. However, by identifying change with the actualization of the potential (ibid.: 201b: 33), he allowed it to be incorporated in a perspectival theory of time.

4.6.4.2 Bergson on Zeno

It is symptomatic that the only analysis (besides the one suggested by Aristotle) that explicitly views time as mental activity turning ‘continuous motion’ (albeit in the sense of a unified, superior continuity questioned above; see 4.6.1) into divisible motion – and thus in principle creating the preconditions for a proper perspectival manipulation by the stable instrument of aspect and tense distinctions, namely Bergson’s theory of time – also offers an answer to Zeno’s paradoxes that, in my view, is close to a solution. Bergson (1911a: 248ff.; 1911b: 308, 311) understands divisibility of motion to be the result of an “artificial reorganization of movement by the mind”. Zeno’s arguments, according to him, originate in the illusion created by this reorganization, more specifically, by transferring properties to motion (and duration) which actually belong to its spatial trajectory. Bergson’s speaking of both motion and duration as reorganized implies that in this act he presupposes temporalization merely as measure. Although he does not in this connection speak explicitly of time, one may with some certainty see in his motionless spatial trajectory an equivalent to the cognitive prototype of time suggested above (3.16, 4.3) as the parallel temporal abstraction of changing spatial distance, i.e., extension of motion between old and new situational states. Bergson’s analysis, though synchronic in essence, does not exceed this cognitive-genetic stage of development, characterized basically by time as measure of duration. The discovery of temporal-perspectival functions and the corresponding development of aspect and tense distinctions implies a deeper understanding of the abstraction of time from its origin in space and motion and the addition of new, more delicate tasks in man’s analysis of situations and change-of-state as well as cause-effect structure.

Excursus III: On the hypothetical origin of time

Since Bergson’s explanation of Zeno’s paradoxes in terms of a spatial trajectory (‘path’) actualizes the cognitive origin of time I consider it appropriate to discuss here at some length the conditions for a corresponding hypothesis.

A feasible assumption appears to be that it all starts (after certain scanning procedures) by our following a body with the eyes and establishing from the
ego-hic position its relation to our own body and the place where it is. This is a simplification, of course, since the ego-hic position cannot have developed without the parallel, successive discrimination of Self and Other. The act of relating normally implies our actual perception of the body in a place in front of our own body (or close to it) and our short-term memory of the body in another place further away from our own body, or vice versa. The origin of time may now hypothetically be looked for in our reinterpretation of a change in distance, i.e., extension in space, between these two places (by abstracting from the body), as a change in distance between an old and new state of affairs. The assumption of this reinterpretation was part of the hypothetical process of essentially metaphorical derivation that eventually develops (see 3.16).

Unaware of the metaphorical processes involved, Aristotle (Physics: 220b: 14, 24) correctly observed the hierarchical interdependence not only of motion and time (as measure) but also – and this speaks in favour of the above hypothesis – of the underlying, changing spatial distance (‘path’): “We measure time by motion as well as motion by time, because they are determined by each other […] This is only natural; for movement corresponds to path, and time to movement, because all these are quanta, continuous, and divisible; movement is so, because the path is so, and time is so because movement is so.”

Although Lakoff and Johnson (1980; cf. also Johnson 1987, Lakoff 1987) do not discuss time as temporal perspective, they offer within their language philosophy of ‘experiential realism’ a cognitive model theory reconcilable with assumptions of the kind just made. The cognitive structure of time sketched above is thus in accord with their deriving abstract concepts from bodily experience (see also Itkonen 1991), here specifically from a kinaesthetic image-schematic structure. Proceeding from Fauconnier’s (1985) notion of mental space (see 2.2) and the idea of abstraction by metaphorical mapping, Lakoff (1987: 267ff., 281–283) suggests his Spatialization of Form Hypothesis according to which “image schemas (which structure space) are mapped into the corresponding abstract configurations (which structure concepts). The Spatialization of Form Hypothesis thus maintains that conceptual structure is understood in terms of image schemas plus a metaphorical mapping.” The hierarchy of successive metaphors suggested above (see especially 3.16) is, in fact, also foreseen by this Hypothesis when stating that “metaphorical mappings themselves can also be understood in terms of image schemas.”

When Bergson speaks of the spatial trajectory or the ‘path’ as described in space by motion he, indeed, reverses the order of the cognitive-genetic hierarchy assumed above. Continuous motion, as we have seen, is basic for him, viz., durée-qualité. His durée-quantité does not distinguish clearly between homogeneously segmented, preperspectivized continuous motion, on the one hand, and motion rendered discontinuous by temporalization proper, on the
other. Temporalization obviously implies that the observer develops and applies a cognitive instrument of analysis for orienting himself in relation not only to bodies changing their actual positions in space but to these changes as part of a changing world/situation he must control in order to survive, and may do so by access to actual perception, memory, and prognostic extrapolation. This control consists in discriminating, comparing, and judging movements in regard to change-of-state and cause-effect, including duration and velocity. It takes place from the viewpoint of the observer (Ego) in a spatial (hic) and now also temporal (nunc) sense. The observer represents the stable viewpoint on changes by relating himself and his observation to one potential segment of motion that – in the case of the prototypical present – coincides with him with respect to space and with respect to time, i.e., from his viewpoint he perceives and conceives it as a simultaneous part of situation-constitutive divisible and continuous motion. The viewpoint of the observer or, in the latter temporali zed sense, the moment of observation (judgement, speech), is the foundation of the meaning of the present tense, and, in the extended perspective, for tense distinctions on the whole. However, in order to develop conceptually, the explicit meaning of the present apparently has to await the aspectual distinction between totality and partiality (Thelin 1990b: 109ff.; see 4.2, 4.8, 8.4.7). The original unambiguous correlation of these aspectual features with past and present, respectively (given the secondary, modal provenance of future), allows the assumption that the distinct meaning of the present appears only as a result of a clear-cut contrast with the past meaning marked by aspectual totality, irreconcilable with the present meaning.

Russell’s (1945: 791–810) harsh criticism of Bergson’s philosophy in general, and his philosophy of change and time in particular, in this light appears unjust and – in the light of recent cognitive-pragmatic developments inspired especially by Peirce – short-sighted. Russell’s remarks on Zeno’s arguments and Bergson’s proposals in this regard reveal his one-sided mathematical understanding of continuity. Russell (1903: 346, 352ff.) admits that the opposition unity vs. manifold “constitutes a fundamental problem of Logic – perhaps even the fundamental problem of philosophy. And being fundamental, it is certainly relevant to the study of mathematical continuum as to everything else.” He adds, however: “But beyond this general condition, it has no special relation to the mathematical meaning of continuity, as may be seen from the fact that it has no reference whatever to order.” The latter argument is not self-evident, as we shall see. To admit, on the one hand, the general relevance of the opposition unity vs. manifold for mathematical continuity, and, on the other, criticize Bergson’s theory of change, based precisely on this opposition, for opposing a mathematical theory of change, is inconsistent. Russell either should have adhered to his opinion that “In the case of Arithmetic, the matter is otherwise, since no empirical question of existence is involved” and refrained from criticizing Bergson, or
he should have faced up to a serious discussion of the relevance of unity vs. manifold to mathematical – and general – continuity and change. Precisely the notion of order – in a general sense, because I believe this holds for the cognitive essence of arithmetical order as well as for order in observed events – has been shown above to be preconditioned by segmentation (partitioning) as a function of the manifold. The fact that Russell admits discreteness in motion and says about time and space that they “may, without positive contradiction, be held to be discrete, by adhering strictly to distances in addition to stretches” renders his criticism of Bergson objectively unmotivated. Russell’s opinion that “Zeno’s argument is absolutely sound” (while Aristotle considered it to be unsound, and Bergson – an illusion) matches his view that “the problem of continuity is better discussed in connection with numbers than in connection with space, time, or motion” (Russell 1903: 346, 352ff.).

4.6.4.3 Peirce on Zeno

Peirce, although he said about the paradox of Achilles and the tortoise that “this ridiculous little catch presents no difficulty at all to a mind adequately trained in mathematics and logic” (CP 6.177), turned to Zeno’s paradoxes repeatedly. Like Russell he tended to see their contradictions as a problem of the arithmetical continuum alone. Accordingly, he saw a solution to the problem posited by a finite continuum of an infinite number of finite distances in an arithmetical calculus by long division or a “rule for the summation of geometrical progression” (CP 6.178, 180). He frankly admitted the “difficulty of the arithmetician who is awkward in finding an appropriate expression of that which Achilles does without the least embarrassment.” Apparently, the difficulties that present themselves along these lines are not that easy to overcome after all. That Peirce’s first statement was somewhat precipitate is evident not only from the complications he encountered but also from his readiness to discuss an alternative solution (CP 6.179). The latter is presented as a “simple reflection”, but I consider it, in fact, to be one of the most important ideas Peirce ever expressed on continuity and time. The idea is simple, indeed, but brilliant when adopted by a perspectival theory of time. By suggesting a system of coordinates he introduces not only a potential hierarchical distinction between continuity (the x-coordinates) and finiteness (the y-coordinates) but also a potential perspectival interpretation of this distinction: “series might be endless in respect to its succession of members and yet very short in another respect.” Peirce is not aware of the temporal-perspectival potential of his suggestion, and, still tending to a solution in terms of properties of a geometrical series, does not identify continuous motion with the x-axis. On my interpretation, the ‘other respect’ (viz. the y-axis) is added (in a hierarchical-processual sense) to the ‘first respect’ (the x-axis), namely in the way homogeneously segmented (preperspectivized) continuous motion is manipulated upon by the stable instrument of temporal-
perspectival analysis. In favour of this interpretation is also the fact that Peirce (CP 6.182), like Aristotle (see 4.6.2, 4.6.4.1), refers to the potentiality of segments as a way to reconcile them with continuity: “Of course, there is a possible, or potential, point-place wherever a point might be placed; but that which only may be is necessarily thereby indefinite, and as such, and in so far, and in those respects, as it is such [my emphasis], it is not subject to the principle of contradiction.” Accordingly, preperspectival, homogeneous segmentation should be viewed as indefinite, i.e., as the preliminary structuring of continuous motion, preparing for its definite, heterogeneous segmentation through temporal-perspectival manipulation as part of change-of-state and cause-effect analysis. For a corresponding distinction between ‘perceptual’ and ‘pragmatic’ states, respectively, see Thelin (1990b: 101).

4.6.5 Plato
Plato (428–347 B.C.) did not contribute decisively to the development of our understanding of motion and time. Within his doctrine of ideas he systematized the Parmenidean view of manifold and change as unreal and unsusceptible of true knowledge. His corresponding distinction between a world of phenomena, on the one hand, and a world of ideas (forms), on the other, prompted, however, the question as to how one ought to understand the interrelations of time and knowledge, among other things. The fact that he allowed of the reality of phenomena to the extent that they ”participate” in ideas can be understood as a certain opening between the two closed systems, viz., the one of idealized knowledge and the one of conceptualization of perceptual objects, respectively. It is also true that ‘opinion’ (doxa) was given a systematic role within this dichotomy as a property of the phenomenal world. It was suppressed, however, as principally irreconcilable with true knowledge (episteme) and never applied to change and time in terms of perspective except in the general sense of their depending on ‘opinion’. This is evident from Plato’s speaking ironically in Theaetetus (through the mouth of Socrates) of Protagoras’ homo mensura principle – the very starting point of perspectivism in Western philosophy. When Plato introduces ‘motion’ as ideal it is the motion of the soul in an upward direction toward the forms of true knowledge, like ‘being’ (constancy), or in the downward direction toward incomplete appearances, like ‘becoming’ (change). Perceived motion is just an image of the ideal motion of the soul. Time is just ”a moving image of eternity” (Timaeus). This metaphor can, in fact, already be found in Indian thought, viz., in the Maitri Upanisads (cf. Mandal 1968: 18).

Mental motion together with the great forms of Sameness and Otherness in Plato appear indeed to indicate a hypothesis of hierarchical cognitive processing on the basis of distinctive functions, but it suffers greatly from unconscious induction and absolute, idealizing deduction, and the corresponding assumption that the sensible world is entirely a creation of ideal forms
applied to matter. Such a one-way model leaves no room for the integration of ‘opinion’ in terms of individual perspectival differentiation with its impact on higher order decisions and, in a mediate feedback fashion, on perception. As opposed to this idealist model we need a model of cognitive realism accounting in a coherent, two-way fashion for the system-permeating role played by perspective in mind-world interaction: a model of perspectival realism.

4.6.6 Aristotle

With Aristotle’s (384-322 B.C.) sound method of cognitive analysis, based on the recognition of the senses as the source of all knowledge, a significant dose of realism was introduced in the history of metaphysics of time. Aristotle (Physics: 217-233) can be said to have laid the foundation of the still prevalent view of time mainly as an instrument for measuring and localizing motion. Accordingly, motion ever since has usually been related to time in terms of moments (points) and intervals. The distinction ‘before-after’ was used both for measuring (delimiting) the extension of motion and for defining the meanings of tense when applied to the ‘now’ of the present time, i.e., the moment of speech. The idealist refutation of change and time as non-existent by the Pre-Socratics and Plato was certainly also the background for Aristotle, but he developed the analysis further independently of this preconception and attained an understanding of time that assigned to it a certain degree of cognitive realism (see 4.6.2, 4.6.4.1).

Still puzzled by the question whether time belongs to existing things or not, Aristotle (like, subsequently, St. Augustine) chose as a starting point the obvious tense distinction between past and future time. From this distinction he inferred that time is divisible, but ”part of it has come into being and is no longer [i.e., is past], part is about to be and is not yet [i.e., is future]; and it is of these parts that both infinite time and any particular time are composed. But that which consists of parts that are not, cannot have a share in being” (ibid.: 217b: 29, 33). Having thus formulated on the basis of tense distinctions the classical argument against the existence of time (although he did not exclude the possibility that “its existence is faint and obscure”), Aristotle turns to the present and says: ”The now is not a part” (ibid.: 218a: 3). This statement is interesting because it conveys his observation that the present differs from the past and future, although they are all not existent things. That his observation that parts of time (as measure), i.e., delimited intervals of time, do not apply to the present, was not a matter of tense differentiation is obvious. His observation, in reality, reveals his intuitive understanding that motion in the past and the future can be referred to in the temporal perspective of a total survey (by marking the beginning and the end) but cannot be so referred to in the present.
That this is a matter of what we know as aspect rather than tense Aristotle did not realize. Therefore he was not in a position to give a systematic explanation of this condition. However, his intuition led him quite close to the aspectual essence of time-related (actual) present as conceived in the theory of aspect proposed here, viz., the partial (TOTALITY) view of events. In a discussion of certain temporal expressions and their relation to the present, Aristotle (ibid.: 220b: 7) thus narrows the concept of the latter by naming it felicitously "the atomic now" and connecting it with the reference point constituted by the moment of speech (compare Xenocrates’ atomic time elements refuted by the Stoics; Sambursky 1959). It cannot be a coincidence that St. Augustine some 700 years later was to run into precisely this problem of temporal-perspectival analysis (see 4.2). It turns out that this crucial problem (a worry also for Einstein; see 4.8) would have to bide another 1600 years for a new approach within a cognitive-pragmatic theory of time and aspect (cf. Thelin 1990a: 29ff., 1990b: 100ff., 107; see 3.12).

Unaware of the underlying aspectual-perspectival function of delimitation (totalization) in measuring time, Aristotle uses his ‘now’ not only for the present tense meaning but also for marking ‘before’ and ‘after’ ("for time is limited by the now"; ibid.: 219a: 22). This now is a tacit appeal to points of reference of a different nature. In the first case it is the moment of speech. In the second case, where time is marked/limited by one ‘now’ before and one ‘now’ after, one must ask how their corresponding points of reference are determined. This question can, as we already know, be answered only by considering the discrimination and comparison of events within a complex situation analysis including aspectual distinctions. It turns out that Aristotle’s ‘nows’ (one ‘before’ and one ‘after’) should then represent indeed the beginning and end of change (of totalized motion), respectively, established by this analysis. However, since he uses ‘nows’ not only in this delimiting sense but also in an absolute, constitutive sense ("Time is made continuous by the now, and divided at the now"); ibid.: 220a: 4), he also ascribes to the distinction ‘before’-‘after’ an absolute sense of succession (reflected by the ‘earlier’-‘later’ distinction of McTaggart’s B-series; see 4.5 and Ch. 7).

These different functions of ‘now’ can, within the present model, be seen to represent, in the last case, the preperspectival, rhythmically based homogeneous divisibility of continuous motion, and, in the two former cases, the perspectival, heterogeneous discontinuation of truly temporal (primarily aspectual) analysis. This interpretation is supported by Aristotle’s speaking also of ‘nows’ (in the constitutive sense) as distinguished from points which are fixed (ibid.: 222a: 10). So far the idea of continuous time can easily be understood as the tacit metaphor of continuous motion. However, by understanding literally Aristotle’s absolute ‘nows’ (viewed, thus, as points) and consequently treating them on a par with the ‘now’ determined by the moment of speech, subsequent interpreters have, in addition, arrived at the less felicitous idea of ‘moving presentness’ as the hypothetical essence of tense.
(and time, as well). Naturally, this idea – for example in the shape of McTaggart’s A-series – has led to the conclusion that time is unreal (see 4.5, and Ch. 7).

I hope to have shown that there can be no thorough understanding of the historical development of temporal research without due consideration of Aristotle’s observations. Although restricted by the conception of time merely as measure, and sometimes contradictory in nature, his proposals are to a high degree reconcilable with the further development of temporal studies toward fundamentally perspectival functions. For one thing, he demonstrated convincingly that time is not change (motion) but something attributed to change by cognitive manipulation (ibid.: 219a: 1; 223: 16ff.).

Aristotle can thus be understood to represent, in the history of time studies, an important first step away from dogmatic idealism toward a more realistic cognitive analysis based on experience. St. Augustine (cf. Thelin 1990b: 95–102, 115; see also 8.2), although still in thrall to the existential properties of time, contributed further to this development by suggesting a psychological explanation of the problem of extension.

4.6.7 Spinoza, Locke, Leibniz, and Hume

Only in the seventeenth century were further important steps taken in a realistic, cognitive direction. As shown by David Savan (1994), Spinoza (1632–1677) made a very important distinction between time as ‘duration’ and time as ‘aid of imagination’. Duration, itself undivided, is imagined to be divided: "The selection of one durational span as a unit by which to divide and number the durations [...] of events depends upon the perspective and purpose of one person, or of a particular society.” The notions of divisibility, selection, perspective, and implicitly, hierarchical transformation, in temporal structure are anticipated here in a way that make them easily applicable in modern coherentist theories of time that extend their attention to complex perceptual-cognitive processes beyond the mere concept of duration.

In his Essay Concerning Human Understanding Locke (1632-1704) objected to the idealist assumption of innate ideas represented by Plato and Descartes and maintained that ideas, and among them the idea of time, originate in experience through the senses and – in cases of complex ideas like time – their abstraction by reflective thought (Locke 1961 [1689]). Proceeding from his distinction between simple and complex ideas, Locke proposed an insightful derivation of time that might in part serve as a useful hypothesis for its ontogenesis (and, possibly, phylogenetic dispositions). According to Locke, motion is a simple idea. The complex idea of time is the result of our mind reflecting upon motion as "the uninterrupted sensible change of distance between two bodies” (ibid.: Book II, c. XIV: §16) and ascribing to it first succession and then duration (by the measurement of its parts). According to Locke (ibid.), the idea of succession and duration emanates from
"the train of ideas in our minds" caused by the perception of motion (as distinguished from Plato's transcendental view). This apparently circular reasoning can probably be explained by Locke's collapsing the two primary levels of cognitive-metaphorical transformation, as evidenced by his defining duration as "fleeting extension" (ibid.: XIV: §1) or "perishing distance" (ibid.: XV: §12). This circularity disappears if we consider succession (and only at a later stage, viz., of measurement, duration) to originate in bodily extension and divisible continuity transferred 'by mind' (my Metaphor I) to changing spatial distance (traversed by moving things, i.e. their trajectories) and then (by my Metaphor II) to change of spatial distance reinterpreted as situational change, i.e., motion (see 3.16). Leibniz (1646–1716) in his *New Essays on Human Understanding* (1981 [1765]: 152) appears to have observed this weakness of Locke's explanation by emphasizing that the idea of succession cannot be produced directly by the sequence of perceptions because they "never have a train sufficiently constant and regular to correspond to that of time, which is uniform and simple continuum." Leibniz's observation points to the problem but does not lead to its clarification by any reasonable hypothesis of the latter idea's cognitive origin. 'Perceptions' here must, according to the present model, refer to the perceptions of events already involving the heterogeneous discontinuation of the underlying (biologically-rhythmically motivated) homogeneous continuum by cognitive processes of temporal-perspectival analysis. On this interpretation, the 'uniform and simple continuum' of time is simply another metaphor collapsing these two distinct cognitive levels (my Metaphor III; see 3.16).

However, in an elucidation concerning the Monads, Leibniz in 1714 (cf. Carr 1930: 149ff.) speaks of time as "an order between existences which are not compresent." Then he goes on to suggest a distinction which appears to revise his previous view (and in a way answers to my suggestion): "This continuity is not ideal but real, for it consists in this order. In ideal continuity the whole is anterior to the parts, just as the arithmetical integer is anterior to the fractions into which it can be divided and which can be arbitrarily assigned to it, the parts being only potential; but in real continuity the simple is anterior to the assemblages, the parts are actual, they are before the whole." Although it remains uncertain whether Leibniz (like Bergson; see 2.2, 3.12) still understands the ideal continuity to be temporal (as in the first quotation), it is obvious that the distinction made here neatly conveys in essence the hierarchical-processual view of temporal analysis discerning events and their order by applying to chaos the ("ideal") continuity offered by biological rhythmization and thus resulting in the "actual parts" of the temporally ordered ("real") continuity. It is understandable that Leibniz, restricted by his tense-based conception of time, besides the general strategy of partitioning, is not in a position to account for the perspectival (aspectual) working of temporal analysis proper between the "whole" of primary continuity and the
"whole" of secondary, synthesized continuity of "assemblages" resulting from this analysis.

As distinguished from preperspectival succession, or rather continuity, duration should be treated accordingly as a function of temporal manipulation on the former in cases of measurement.

In this connection it should be remembered that within the circular feedback model of cognitive processing suggested here it is no contradiction that measurement, i.e., temporal quantification (between 'before' and 'after'), from a synchronic viewpoint presupposes temporal qualification, i.e., aspactual totalization (delimitation), at the same time as the former may be assumed to have been the original ontogenetic trigger of the latter (see 3.12, 3.16, 6.4.3, 8.4.3). In an equivalent way (cf. Thelin 1990b: 108ff.), the foreground-background distinction may be assumed to emerge as a result of events being temporally abstracted by backgrounding from the biopragmatically primary foreground of situational changes. From this viewpoint, the first question to be asked is whether events belong in the foreground or not, or rather represent a change-of-state or not. On this view, underlying the assignment of aspectual perspective suggested above (see 3.13), change-of-state-relatedness (close background) and non-change-of-state-relatedness (remote background) are established in response to questions of subordinate hierarchy.

Locke’s hierarchical-processual understanding of the cognition of time as based on the senses is completed by its allowing of both external and internal senses. This approach creates prerequisites for a model not only linking, in a coherent process, perception of motion to the various levels of temporal cognition but also integrating with this process, through internal senses, the presuppositional experience accumulated and idealized by abstraction from the external senses. This experience (broadly interpreted) is thus represented by indirectly perspectivized background knowledge (long-term memory) together with situational knowledge (short-term memory), including actual perception, directly perspectivized according to volition and the possibility or necessity of action, in turn dependent on individual emotions, values, needs, interests, ‘opinions’, belief, intentions, expectations, etc.

These features of cognitive realism bring Locke to a conception of time that is consistent with its perspectival essence. The abstraction of time, accordingly, must be seen as successive steps in one complex hierarchical-cognitive process linking it naturally to the perception of motion. There is thus no need to postulate ad hoc any innate idea of time as such or any corresponding ‘pure intuition’ existing a priori, i.e., transcending our experience (as suggested by Kant; see 1.2), if we can show the coherent, processual interrelation of time (as composite analysis) with sensory experience to reflect some degree of reality. This does not exclude the possibility or, even, the probability of certain innate principles of human perception and cognition (based on memory) about the nature of which we can only speculate.
Possible candidates for such principles, conditioned by existential finality, might be: apprehension of extension in things as prerequisite for rhythmically introduced divisibility and continuity primarily in things and their distances; on this basis – an increasing degree of cognitive processing and the constructive-perspectival perception of space, motion (events) and time, mainly in terms of change-of-state and cause-effect analysis, viz., by way of predominant strategies such as analysis-synthesis (i.e., decomposition-composition, unity-manifold, metonymy, 'wholes' and 'parts'), analogy (cognitive metaphor), hierarchical ordering, and binary oppositions. To what extent specific temporal meanings, above all the aspectual-perspectival distinctions as derived here from the human analysis of space and motion (see 3.16), and insofar as they may be said to be founded on these very principles, are innate and universal in mankind, is still an open question. From hierarchical-cognitive as well as cross-linguistic considerations it appears more probable, however, that aspect cognition (perception-cognition) is a stronger candidate for such a status than is tense (and taxis) cognition. The intricate question we constantly confront in this kind of theoretical modelling therefore remains where to assume the line between phylogenetically motivated cognitive (rather than perceptual, or perceptual only in a mediate sense) distinctions activated by language and cultural learning, on the one hand, and cognitive distinctions introduced in ontogeny by language and cultural learning, on the other.

In regard to the concept of time as an epistemological problem, Locke’s empiricism can thus be viewed to have created more realistic conditions for its treatment within a perspectivist project. This would hold to a still higher degree for the sceptical theory of knowledge derived radically from Locke’s experientialism by Hume (1711-1776), were it not for its excessive solipsism. The latter denied absolute knowledge about the world and recognized only certain principles for the organisation of our experiences based on subjective-habitual interpretations of causality. The problem remains: how are we to integrate in a theory of knowledge, universals of thought and language with functions of perspective? For my proposals with regard to the indispensable interaction of subjective perspective and cognitive-linguistic intersubjectivity, see Ch. 1 and Section 3.2).

4.6.8 Kant

This development toward a realistic-perspectivist approach to knowledge and the concept of time was arrested to some extent by Kant (1724–1804). In his endeavour to secure within his critical rationalism (see 1.2) a scientific foundation for a theory of knowledge in contrast to Hume’s radical scepticism and, obviously, under the influence of Newton’s absolute conception of time, he established a corresponding cognitive 'absoluteness' for this category. He defined it as 'pure intuition' existing a priori, i.e., before any sensory
experience. According to this idealistic view it would not be possible to define time consistently from the abstraction of perceived motion (or, rather, in my view, space and motion) as suggested by Locke and Leibniz.

This classical controversy in the history of time studies certainly has to do with the components of perception and cognition established by the analysis as such. However, it also has to do to a significant extent with the specific kind of hierarchical relations that is ascribed to these components according to the theoretical-methodological considerations underlying the analysis. Locke’s model can generally be said to imply a coherent cognitive process, whereas Kant’s model by the isolation of a priori knowledge becomes, at least in part, non-coherent and static (see below). A coherent hierarchical-processual model of cognition (with ambitions to reflect to some reasonable extent conditions not only of phylogeny and ontogeny but also of synchronic application) necessarily presupposes a mechanism of permanent feedback between perception and cognition. In such a model, a priori knowledge does not belong, if understood to be transcendental, i.e., to defy logical coherence with sensation-based knowledge. This would also hold for those cases where we may assume a priori knowledge in the sense of inherited dispositions of strategy to perception and cognition independent of experience (i.e., phylogenetically motivated, but dependent on ontogenetic activation). In the former sense there is not, as I hope to have shown, any need for postulating, as Kant did, any a priori concept of time as such, imposing form on sensations independently. A coherent feedback model allows us to take into account in a realistic way both the cognitive-pragmatic interdependence of time and space-motion, on the one hand, and the superordinate hierarchical position achieved by time through abstraction, on the other. From the latter condition time can be derived in a natural way and declared – primarily in its fundamental aspectual functions – to be a necessary condition for experiences of and propositions about the world to the extent that events are involved either directly or indirectly.

Now, my remarks on Kant so far do not do full justice to his achievements in regard to the cognition of time. This is not the place for a comprehensive account, but I would at least like to point to those important proposals of his which, in my view, can be said to continue and deepen – within his critical rationalism (cf. especially his *Critique of Pure Reason*) – the development toward a more realistic conception of time.

First of all, Kant’s treatment of time as a priori knowledge (‘pure intuition’) should not obscure the fact that time, according to him, represents synthetical knowledge. That is, there is a necessary cognitive connection with experience in the shape of sensory material that permits us to establish a hierarchical relationship, whereas processuality is restricted by the logically non-coherent synthesis of transcendental form with sensory material. If Kant’s assigning transcendental status to time as a cognitive entity had not been a matter of ideological doctrine (cf. Newton’s possible influence), it
might as well be the case that the non-coherent, a priori character of the corresponding synthesis could be a consequence of some missing links in his chain of derivation. This assumption would appear reasonable in the light of the complex metaphorical-transformational structure assumed above. According to this analysis, the cognitive characteristics of time are thus not a priori but can be derived through logically coherent steps from the cognition of space (see 3.16). The corresponding process of cognitive-metaphorical transformation implies that we treat by analogy (in the following hierarchical order) space, motion, and time as if they were things, i.e., ascribing to them (on the different cognitive levels) bodily extension and divisible continuity.

Within this framework it would be possible to imagine that apprehension of things and their extension (in agreement with Kant’s assigning to them the status of a transcendental category) indeed implies some kind of disposition (still understood, though, to be logically coherent with a posteriori knowledge) including cognitive a priori strategies reflected by notions like, for example, unity vs. manifold and ‘wholes’ vs. ‘parts’. Divisibility of ‘reality’, made possible by extension, appears indeed to be fundamental for at least two reasons: (a) the physical confinement of our visual field; and (b) the need for manageable parts without which things and events cannot, if necessary, be defined by appeal to the entirety of their distinctive properties relevant to our judgement of identity or change in the given situation. According to this assumption, the rhythmically based homogeneous segmentation of ‘reality’ by assignment of divisibility and continuity to chaos would be a candidate for ‘a priori knowledge’, or rather, a knowledge-seeking strategy, and prerequisite to apprehension of identity or change. Heterogeneous discontinuation utilizes this homogeneously divisible structure of continuity a posteriori, i.e., for experience-based analysis by way of discrimination, comparison, and identification. With respect to events the latter discontinuation implies temporal-perspectival analysis proper as part of change-of-state and cause-effect analysis, measurement, and localization of reference points (cf. Thelin 1990a: 18ff).

Excursus IV: Hegel, Heidegger, and Cassirer

Hegel (1906: § 254ff.) must have had in mind conditions equivalent to those discussed above when he, proceeding from space, defined time as the "negation of negation as punctuality", i.e., the annulment of punctuality as "peaceful adjacency" (das ruhige Nebeneinander), viz., of space, and the corresponding specification (das Fürsichsetzen) of individual points, viz., time. Points thus specified are the setting for succession (das Nacheinander). This analysis is principally reconcilable with the essentially metaphorical derivation of motion and time from space as proposed above.

Heidegger’s (1953: 428ff.) criticism of Hegel’s conception of time does not shed new light on the interrelations of its perception and cognition. His
notion of ultimate ‘temporality’ (Zeitlichkeit) as the foundation of all existence, in my view, defies integration in a coherent theory of time as cognitive-pragmatic and linguistic reality.

The path of derivation described by time from continuous motion (“mutual dynamic dependence”) through cause-effect analysis to its status of “condition and content of knowledge” (from which I understand it ultimately to be applied, so to speak, in the reverse direction) was observed with deep insight by Cassirer (1923: 170).

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The ideological background of Kant’s transcendentalism was, as assumed already, his conviction that – in contrast to Hume’s sceptical empiricism – there must be an alternative, scientifically objective, foundation of knowledge. Time as transcendental form cannot, accordingly, be private but must be objective, because it is the form of objective reality. This transcendentalism is idealistic since it assumes a reality, for example, a factual order of events, imposed on our experience of it, understood, accordingly, as an apparent order of events. Far from an experience-independent view of time (like Newton’s absolute one), Kant still seriously reduces the role of experience in his conception of time. He not only overlooks its possible coherent derivation from perception of space and motion; he also is not in a position to account for its constitutive perspectival functions implied by private experience (in the broad sense of foreground and background knowledge). In my view, there are no factual or apparent orders of events; there are only experienced orders of events. If observers perceive and conceive of identical orders of events, this tells us only that they have the same experience, including perspective. By abstraction from concrete, individual experience, time becomes a non-private instrument subject to collective (at their base, presumably universal) cognitive-pragmatic and linguistic rules. This is a prerequisite for its application, in the other hierarchical direction, to ‘reality’ in order to organize and communicate – in agreement with typological and language-specific idiosyncrasies – this ‘reality’ from the perspective of private experience.

When it is said that languages may differ with respect to temporal categories, this is normally a matter of language-specific and typological strategies and conventions mainly concerning redundancy conditions and morphosyntactic implementation (cf. Thelin 1986). Only in this sense can we, for example, speak of ‘aspect languages’ (see Ch. 10). In a cognitive sense, however, the temporal distinctions implied by aspect – by tense and taxis, probably, only in a fundamental sense – are universal in essence and play a decisive role in our perception, cognition, and linguistic reproduction of ‘reality’. When it is maintained that people experience time differently, this can be said to be a reality in a restricted sense, for example, insofar as the
superficial metaphor of 'moving time' is a cognitive reality. We are – if we take this important case – not always aware of the fact that what really matters is our experience of change (of which time is only the 'measure'). In our interpretations of the world we may in different situations or phases of life, according to a given background (and within certain limits), give preference either to constancy or change (this is in accord with the view that the analysis of change and perspective are interdependent). Such variation has also been observed in regard to different civilizations as an expression of cultural-ideological identity. The Indian 'conception of time', for example, has been described as static in comparison to the dynamic Western one (Nakamura 1968). That it, also in this case, is rather a matter of (perspectival) attitude toward change vs. constancy than it is to time as such has been demonstrated by Baumer (1977), who describes the historical development of ideas in Western civilization as a successive transition from 'Being' (constancy) to 'Becoming' (change). Language-specific and typological variation in temporal distinctions, according to this understanding, would then be reflected on rather superficial levels of cognition (and, thus, favour merely a weak variant of the Sapir-Whorf hypothesis). Whorf (1950) demonstrated thus that the Hopi model of the universe can do without 'time' (in the sense of linguistic tense distinctions; see 2.2) due to a distinction instead between manifested or objective and unmanifest or subjective events, respectively. However, time in a more fundamental perceptual and cognitive-pragmatic sense, i.e. as perspective on change, would, on the present analysis, inhere also in the universal foundation of the Hopi language.

Notwithstanding the shortcomings of Kant's conception of time, his general understanding of this category bears witness to his genius. As pointed out by Melnick (1989: 23, 25), Kant's basic assumption is topological and thus principally reconcilable with the space-based metaphorical derivation of time proposed above. In agreement with his advanced view of space and time as performance or activity (while understanding the latter as transcendental forms of intuition or pure activity; ibid.: 25, 197) he even suggested a "doctrine of motion" or "kinematic construction" including space and time (p. 471ff.). Kant did not discern here the logical-hierarchical derivation of time but suggested a solution consistent with the 'path' analysis discussed above (4.6.7). Accordingly, "kinematic construction is the act (flow of attention) by which a kinematic diagram is produced" and motion is "the description of a space, but in such a way that 'I pay attention also to the time involved therein'." The "kinematic diagram" would fit my notion of homogeneous divisibility and continuity, but Kant does not distinguish between the latter and heterogeneous discontinuation; and divisibility in general is held rather not to be cognitively representable. Melnick (p. 198ff.) is aware of the contradiction between elements and continuity and indeed suggests a hierarchical distinction between the continuum as "an abstract structure of choices (= the elements) in an abstract activity", on the one hand, and the particular
"choices of cuts or breaks" performed on this structure, on the other, corresponding thus to my homogeneous divisible continuity and heterogeneous discontinuation, respectively. Melnick made his proposal with respect to space only (cf. also p. 479), but in view of my suggestions above it would apply to motion and time as well. If we understand his view that "the continuity is in the choice structure, not in the flow per se" as referring to the original, abstract structure, it would be consistent with the view that divisibility in motion (by the transfer from space, not observed by Melnick) is a prerequisite for its very apprehension (see the end of section 4.6.1). Divisibility or phasality as the foundation of spatial and temporal relations is thus constitutive of motion. Without it there would not even be any continuity – just indiscernible chaos – and certainly not time.

4.7 Peirce on continuity and time

That my discussion of space and time should end up with the question of continuity and its modes of transformation is logically inevitable, since we have reached a cognitive (perceptual-cognitive) level of considerable depth, already recognized by the Pre-Socratics in the distinction between unity (constancy, continuity) and the manifold (change). This leads us in a natural way to Peirce, to whom continuity would develop into one of the most central issues of his epistemology. For Peirce (CP 6.169) continuity was the very foundation of philosophical thought, and his essentially processual method of synechism insisted "upon the necessity of hypotheses involving true continuity." In this spirit he also applied continuity to the prime concepts of space and time. Peirce never presented any coherent theory of time, but he discussed this concept repeatedly, sometimes extensively, often so in connection with the issue of continuity (CP 1.167, 169, 170, 274, 499). It is obvious that the central position of time in Kant’s philosophy was a challenge for Peirce and a permanent cause for worry.

We know from Peirce himself (CP 5.525) that he "more than" admired Kant and felt a certain affinity with him as "nothing but a somewhat confused pragmatist", although he also called him "a sort of idealist" (CP 1.39). Peirce pointed out that Kant’s limitation of time to possible experience is pragmatism in the general sense, and added: "and the pragmaticist, as fully as Kant, recognizes the mental ingredient in [this concept]. Only […] he defines more definitely, and somewhat otherwise, than Kant did, just how much of the ingredient comes from the mind of the individual in whose experience the cognition occurs” (CP 5.525). This is, I believe, a neat way of indicating the question raised explicitly above, viz., how much is left of the concept of time for its transcendental form of intuition posited by Kant? Peirce does not go that far and does not object to Kant’s idea of 'pure intuition’. He rather defends it against misinterpretations but does so from the
position of a pronouncedly logico-coherentist, pragmaticist understanding (W 1.247; see also W 2.199, note 4): 
"[W]hen Kant speaks of the pure intuition from within […] he does not mean that intuition can exist without some empirical representation […] The word pure is used not to show that such representations are not present to the mind but to signify that the intuition intended is that from which […] impurities have been eliminated by abstraction.”

This view was expressed more generally in one of Peirce’s Cambridge Conferences Lectures (cf. Ketner 1992: 260): 
"[T]he whole Platonic world which in itself is […] real, is evolutionary in its origin […] And among the things so resulting are time and logic.”

Applied thus to time, this understanding would amount to saying that time achieves its superordinate status of necessarily applied form by coherent abstraction. This was also my view as expressed above. Is it then just a matter of how we represent this process of abstraction? No, again there rather seems to be an ideological reason for Kant’s sorting out this ‘ultimate’ stage of abstraction or, at least, leaving its cognitive status undetermined. Peirce (CP 6.96) observed this indeterminacy and wanted to make it clear: 
"[T]ime is real, whether we accept Kant’s dubious view of it, which he is certainly far from making evident, as the form of the internal sense, or not.”

On another occasion Peirce (CP 1.384) is still more direct in his criticism: 
"Kant gives the erroneous view that ideas are presented separated and then thought together by the mind. This is his doctrine that a mental synthesis precedes every analysis.” Peirce instead proceeds from what “in itself has no parts” but is ”analyzed by the mind” and then synthesized: “An earlier synthesis is a fiction.” If we apply the three stages of this general mode of procedure to continuity as interpreted here they might roughly correspond to (1) chaos, assigned extension as a prerequisite for its primary apprehension in things; (2a) on this basis, assignment of rhythmically based divisibility (and, accordingly, continuity); (2b) analysis proper, i.e., heterogeneous discontinuation; (3) synthesis, i.e., establishment of a new, heterogeneously relational continuity – an ordered world of identities. In fact, we must probably assume (2b) and (3) to partake of one simultaneous process of mutual analysis-synthesis successively establishing the synthetic order of the world (see the end of 1.4 and 1.5–6).

However, to Peirce the above procedure apparently would not apply to time since the latter, according to him, ”belongs to genuine synthesis” (CP 1.384; my emphasis). The reason for his omitting analysis in the cognition of time I would primarily ascribe to his non-discernment of the metaphor of ‘moving time’ (ascribing motion to time and not the other way around) and his corresponding non-recognition of the underlying analytical steps of primary metaphorical transformation leading to the idea of continuous time. But this has consequences on the categorial level (reminding one of Kant’s treating time as synthetical a priori knowledge) insofar as time as continuity is absolutized. To Peirce time is thus ”strictly continuous” (CP 1.169, 170,
274, 499), and continuity is Third, viz., "synthetic consciousness, binding time together" (CP 1.377). Continuity to Peirce is generality, and time, accordingly, becomes Third, Law, and Habit, "genuine synthesis".

Under these conditions the concept of time in Peirce receives an absolute cognitive status correctly observed by Putnam (1992: 82) and contradicted not only by Peirce’s general methodological principle of synechism but also by his incisive observations of space and time reaching beyond continuity (see the further discussion below). Putnam (ibid.: 77) points, accordingly, to the fact that Peirce’s paradigm of continuity sometimes contains singularities. Peirce (CP 1.383) was aware of the necessity to account for the interrelations between the absolutized form of temporal continuity, on the one hand, and, on the other, the condition that "in our first apprehension of our experiences, we cannot choose how we will arrange our ideas in reference to time and space, but are compelled to think certain things as nearer together than others.” To be sure, this is a significant modification of time as a 'form of intuition' (and probably the reason for Peirce’s critical remarks on Kant above), but it does not cause him to take any corresponding analytical steps linking perception to cognition in a more coherent way. On the contrary, from a position affiliated with Kant’s he prefers to see the order of experiential facts rather as “external compulsion” and an instance of “degenerate synthetical consciousness” or “accidental Thirdness”.

If we overlook this incoherence in Peirce's conception of time, his formulation above (“we cannot choose […]”) still gives a good idea of time as a necessary but not arbitrary form assigned to event structure. From his restricting the choice of temporal order by reference to externally compelled "association of contiguity" we may further conclude that he, indeed, recognizes a possibility of choice attached to the very "construction of time" as intuitive form. That Peirce might have perspective in mind would be merely a daring guess, were it not for his subsequent statement: "It would be putting the cart before the horse to say that we are compelled to think certain things together because they are together in time and space: the true way of stating it is that there is an exterior compulsion upon us to put them together in our construction of time and space, in our perspective” (CP 1.383; my emphasis).

This is, as far as I have been able to establish, Peirce’s only mention (without further elaboration) of perspective in connection with time. May we assume that the reason for the absence of this notion in the rest of his work is systematic, i.e., that it ideologically had no place in a theory of knowledge ‘mediating’ between realism and empirically based ‘objective idealism’? In any case, individual ‘opinion’ (doxa) as suppressed by Plato must for Peirce have lost its actuality, at least as questioning true knowledge, because for him real things cause either true or false beliefs. ‘Opinions’ are of interest to Peirce mainly as pertaining to the evolution of science. He does not agree with those who “seem to believe that disputation is ever to cease” and “that
the opinion which is natural for one man is not so for another, and that belief will, consequently, never be settled” (CP 5.406). Instead he maintains that "no modification of the point of view taken, no selection of other facts for study, no natural bent of mind even, can enable a man to escape the predestinate opinion […] The opinion […] to be ultimately agreed to by all who investigate, is what we mean by the truth, and the object represented in this opinion is the real” (Peirce W. 3.271–73). It appears difficult to imagine under the conditions, fixed by a metasystem of scientific-cognitive procedure of the purport suggested by Peirce, a decisive component of perspectival differentiation in the system of basic human cognition.

Putnam (1992: 73) in his comments on Peirce’s Cambridge Conferences Lecture IV understands this view of Peirce’s as belonging to the tradition of metaphysical realism and thereby as diverging from the view held by pragmatists like James and Dewey: "[N]either of them supposed that that to which inquiry would converge is independent of us, of what interests and ideals we have, and what questions those interests and ideals lead us to formulate. Those interests and ideals (and the problematic situations we are in) shape our very categories.” It is reasonable to assume that this conception of pragmatism is more apt to allow of an integration of perspective into the system of both metacognition and cognition. Here the question is rather: how may we assume knowledge to be structured to conform to perspective (see Ch. 1, especially 1.14–18)?

There is another interesting case in Peirce’s Cambridge Conferences Lecture VII (on Habit; cf. Ketner 1992: 227ff.) where he discusses differently perceived motion in two equal coupled pendulums. He refers to the two possible views, viz., the one of analytic mechanics and the ’intuitional’ one, as expressions of two different ”aspects”. He explains the latter, assigning order to the pendulums, by ”our natural tendency to prefer the formula of causation.” This and the above statement on perspective indicate a direction of temporal studies that Peirce himself – obviously for reasons just indicated – did not pursue further.

Proceeding from his conception of continuity as basic, Peirce suggests the following hypothetical definition of time: ”the form under which the law of logical dependence presents itself to intuition.” This form one might understand to imply homogeneously divisible continuity as proposed above. This understanding appears to be supported by Peirce’s view that ”the flow of time […] in itself is a regularity” (CP 1.411). Heterogeneous analysis, operating, according to my proposal above, on the former, and leading thereby to discontinuity, is observed by Peirce only in regard to the moment of speech (the present). His interpretation is that the significance of ”discontinuity at the actual instant” is ”that here new premises not logically derived by Firsts are introduced.”

Notwithstanding the latter indication of hierarchical analysis, the contradiction of continuity vs. discontinuity remains a worry for Peirce in his pre-
conception of ‘moving time’ as basic. This becomes evident in his discussion (in his Cambridge Conferences Lecture VI; cf. Ketner: 1992: 216; CP 1.274) of instants of time: "[A]lthough it may be said that continuity consists in a [binding] together of things […] , so that they [i.e., the instants of time] are in a measure dependent on one another and yet in a measure independent, yet this is only true of finite parts of the continuum.” Due to the missing cognitive coherence, which would allow us to remove this contradiction by successive analytical operations of time on motion/events, Peirce instead sees its solution in the static distinction between the discontinuity of a point at the present (the Aristotelian view; see 4.6.6) and the continuity of all other points. Under these circumstances discontinuity in the past and the future is not accounted for, and time as a measure of and perspective on events remains without a proper foundation.

It is still possible, however, to relate in a consistent way the transformation of continuity, as I interpret this process in relation to time, to Peirce’s universal categories of Firstness, Secondness, and Thirdness (see also 5.7):

(a) Thirdness as Law or Habit comprises the underlying primary metaphors assigning bodily extension and divisible continuity to space and motion (in this order; see 3.16). On the hierarchical level of this Peircean category, continuity (of relevance for time) is thus the result of rhythmically based homogeneous divisibility applied to motion (and, only by way of secondary, i.e. superficial, metaphor, to time itself). As such it fulfils the function of medium (CP 1.382) and corresponds (as preperspectivization) to Aristotle’s ‘potentiality’ (dynamis).

(b) Secondness (as ”the consciousness of an interruption”, ”of an external fact”, ”of another something”; CP 1.377) represents the cognitive level on which time as relational instrument is applied to homogeneously divisible motion for the purpose of perspectival differentiation, measurement, and localization of events. Temporal operations are understood to partake of change-of-state and cause-effect analysis. On this level continuity is changed into discontinuity by heterogeneous analysis.

Relatedness is established by the effort of temporalization corresponding to Aristotle’s ‘actualization’ (energeia).

(c) Firstness (as immediate perception) represents the unreflected and unstructured ‘chaos’ of visual material before its subjection to Thirdness and its transition to Secondness by way of a coherent process of circular feedback derivation. This level of Firstness is characterized by un-relatedness. Peirce’s (W 5.304) own definition of Firstness includes absence of continuity in terms of consistency (i.e., ‘chaos’): "There is no synthetical unity in it, no wholeness nor consistency; it is the sheer wonder and manifold of impressions. In itself, however, it is not manifold; it has no parts." Then he adds: "[B]ut because it has no wholeness nor consistency, the understanding analyzes it [i.e., by way of Thirdness and, specifically, Secondness; my explication] into an infinitely varied manifold.”
Peirce did not discover that the analysis implied by his three universal categories (in the above interpretation) is constitutive also of the very concept of time and that time as such indeed has a given place in the hierarchy of these categories – not mainly as Thirdness (as Peirce would assume), but as Secondness. Although we might be tempted to see Peirce’s abstracting-by-’distillation’ of time and its remaining cognitive incoherence rather as transcendentalism still to be accounted for as a hypothesis within a logically consistent (though incomplete) chain of abductive conclusions, there are circumstances which do not speak in favour of such an assumption. It appears that Peirce in his treatment of space and time, like Kant, was bound by at least a partial ideological commitment to Newton’s doctrine of absoluteness (cf. his Cambridge Conferences Lecture on Habit; Ketner 1992: 226): ”Space and Time are not mere relations but are absolute subjects or substances.” This standpoint emerges also from Peirce’s statement that ”the question of the relativity of motion is a question of the measurement of space, not of the nature of space itself.” This understanding he applied to his conception of time as well (ibid.: 264): ”Time. It makes no difference what singularities you may see reason to impose upon this continuum […] But all this is quite extrinsic to time itself.”

Within this rather absolute conception of time, Peirce gave expression to the fertile idea (inherited from Locke) that continuity in the shape of extension and duration is secondarily ascribed to space, motion, and time so as to ”reduce the phenomena to unity” and ”order or mediate simplicity” (W 2.199). This understanding is in perfect agreement with the metaphorical analysis of space and motion above, ascribing to the corresponding processes involved a hierarchical succession, albeit within Thirdness. The adequacy of this interpretation of Peirce’s general conception of time appears to be confirmed by his reference to these still restricted observations as a ”theory of space and time”.

Peirce correctly saw the solution of the problem in the further analysis of the concept of continuity, but his non-discernment of the secondary or superficial metaphor of ‘moving time’ and the resulting adoption of its partly absolute, transcendental status blocked his way. His serious attempts in this direction, however, help us see more clearly which further steps may appear more promising. This state of affairs is very much in accord with his methodological principle of fallibilism (“The principle of continuity is the idea of fallibilism objectified”; CP 1.171).

Peirce’s essentially hierarchical-processual understanding of cognition related to the problem of continuity (as explicated above) was expressed, for example, by his reference to Spencer’s phrase about ”the undifferentiated differentiating itself” and ”the homogeneous putting on heterogeneity” (CP 1.174; cf. Ketner 1992: 258). Accordingly, he suggested that ”we must suppose that as a rule the continuum has been derived from a more general continuum, a continuum of higher generality” (CP 6.191). It is also important to
stress that Peirce – although he accepted Kant’s idea of time as transcendental form – gave it a pronouncedly pragmatic interpretation: “One instant of time is, in itself, exactly like any other instant, one point of space like any other point; nevertheless dates and positions can be approximately distinguished. And how are they so distinguished? By intuition says Kant […] But I should prefer to say that it is by volitional acts that dates and positions are distinguished” (CP 8.41). From the above discussion it should be evident that what Peirce refers to here is the very process of temporalization represented, in my view, essentially by Secondness but excluded by Peirce from the concept of time itself, understood as continuity and Thirdness.

Having thus related my interpretation of Peirce’s conception of continuity to his categories of Firstness, Secondness and Thirdness, we are in a position to understand better his otherwise untransparent "Law of time" as formulated on the basis of the recognition of time as a necessary form (CP 6.96, CP 1.488–499). Considering the restrictions imposed on this proposal by the missing steps of metaphorical transformation and by his traditional, predominantly tense-based, conception of time, this is as close Peirce comes to a theory of time. The strength of his proposal thus lies rather in its methodological implications than in the number of facts it explains. According to Peirce (CP 1.494–499), the law of time "has three requirements, a monadic, a dyadic, and a triadic." The monadic requirement is "that nothing dyadically exists as a subject without the diversification which permits it to receive contrary accidents […] Time is that diversity […] The dyadic requirement of the law of time is that if a subject existentially receives contrary attributes, of the two contrary states an existentially determinate one is first in the existential order of evolution.” The triadic requirement implies “that time has no limit, and every portion of time is bounded by two instants […] and between any two instants […] instants may be interposed.”

I understand the monadic requirement to correspond here to Firstness in the sense of potential being (CP 1.494) or precondition for existence ‘in time’ through relations, i.e., the monadic requirement implies the fulfilment of the triadic requirement as well. In accord with Peirce’s view (CP 1.490) that "to carry out and perfect the monad, we need next a dyad", the dyadic requirement would then represent Secondness in the sense of "consciousness of another something" (CP 1.377) and the ordering of two corresponding events ‘in time’ by "reference to some kind of standard” (CP 1.497). The triadic requirement would, finally, correspond to Thirdness in the sense of this standard, viz., homogeneously divisible continuity as a medium for sequencing, i.e., Peirce’s infinitely divisible time.

The hierarchy thus established suggests (see Figure 4) that homogeneously divisible continuity as Third represents a superordinate, general rule (habit) derived by abstraction from First and Second (First > Second > Third). However, actual application of the established hierarchical order in construction is a process of partially reverse order (First > Third > Second), answer-
Peirce’s deep understanding of the cognitive processes involved is evidenced by his discussing precisely such hierarchical-processual relations (CP 1.490) – although in the abstract terms of monads, dyads, and triads, without assigning to them any determinate correlation with the steps of temporal derivation as suggested above. The two possible directions of the cognitive processes indicated here (and the circular feedback function implied thereby) are thus reflected in Peirce’s distinction between the two paths of “(logical) involu-
tion” (A arrows) and ”evolution” (B arrows), respectively. He describes them as “two sides of the shield, both of which must be examined, and which have to be synthesized in the really philosophical view”; ”the view which takes the triad first is necessary to the understanding of any given point, yet it cannot […] be carried out in an entirely thoroughgoing manner [my emphasis]”. The latter becomes possible “when the [monad-idea] has been constructed” and ”according to the path here pursued from monad to triad […] we pursue a path of evolution […] To carry out and perfect the monad, we need next a dyad” (CP 1.490).

Peirce’s definition of time as ”the form under which the law of logical dependence presents itself to intuition” (CP 6.87) can then be understood to assign to homogeneously divisible continuity the role of basic vehicle in change-of-state and cause-effect analysis. For this reason he was not in a position to account for the fact that the role played in the latter analysis by time as means of perspective, measurement, and localization, implies, on the contrary, discontinuity. Besides statements of the purport that these processes do not pertain to time itself (viewed by him as continuity and Third), there are, however, other remarks that make it more plausible that time (as I suggest) should rather be a matter of Secondness. This ambiguity, I believe, is
demonstrated, for example, by his speaking of time as "diversity" (see above) and thus relating it indeed to Secondness.

To Peirce continuity in existing things was a mirror of the continuity of thought (CP 1.489; W 3.68ff., 105ff.). This Platonic view (held also by Locke) was adapted to Peirce’s objective model of coherent abduction only to the extent that this analysis allowed of it. From the two directions of cognitive processes he concluded the circularity of time (CP 1.498). He tended to absolutize time as continuity because he had not discerned its primary steps of metaphorical derivation. Consequently, he treated the secondary, superficial metaphor of ‘moving time’ as fundamental and ascribed continuous motion to time instead of to events. However, he thought of time as real and was well aware of its special transcendental status. He did not consider it a metaphysical law, but "next door to" it (CP 1.489). Peirce thought that the logical dependence realized by time is contingent and subject to volitional acts.

4.8 Summary

What conclusions may we draw for a theory of knowledge from the above reflections on time in historical perspective? What implications for the traditional philosophical oppositions of rationalism vs. empiricism and realism vs. idealism may be said to emerge from the perspectival function of temporal distinctions and their coherent cognitive derivation from the perception of space and motion as suggested above?

First of all, if perspectival variation is assumed to have bearing upon knowledge, it must be a challenge to the rationalist thesis of stable and immediately (‘intuitively’) accessible knowledge without the involvement of language and perceptual-cognitive processing. The foundation of perspectival variation on individual experience (in a broad sense) speaks rather in favour of empiricism, if we have in mind a moderate kind of empiricism. The latter must, in harmony with Locke, allow not only of immediate, ‘outer’ senses, but also of mediate, ‘inner’ senses, i.e., of access to an individual history of experience linked to immediate experience (perception) by the coherent hierarchical-processual device of rationalization, i.e., cognition. Within such integrative experientialism there is no need to treat time as a priori knowledge.

These requirements are met by pragmatism, more specifically as conceived by James and Dewey. If, accordingly, our individual emotions, values, needs, interests, intentions, expectations, etc., and the ‘problematic situations’ we are in indeed ‘shape our categories’ (see above, 4.7), then a corresponding experiential model requires mechanisms that by abstraction ‘purify’ individual knowledge and perspective to make them commensurate
with (part of) intersubjective knowledge and understanding through actional and cognitive-linguistic communicability (see Ch. 1, especially 1.13–18).

The process of abstraction, reconciling individual and collective knowledge (including perspective), may therefore be assumed to take place as our rationalization of experience. This would speak in favour of rationalism, but a moderate kind of rationalism like, for example, Husserlian phenomenology, which integrates cognition (‘acts of synthesizing identification’) with perception (see also 1.11 and Ch. 6).

As to the opposition realism vs. idealism, the decisive role ascribed to perception in a theory of knowledge by considerations of individual experience and perspective relates knowledge explicitly to what is perceived. When we call what is perceived ‘reality’ or the ‘outer’ world, what kind of relation do we have in mind? Is it, indeed, a ‘reality’ outside us, or a ‘reality’ of which we are an active part? Is it a ‘reality’ that exists in space and time independently of our perceiving and conceiving it? Or is it a ‘reality’ that exists merely in our ideas, or percepts to the extent that they represent these ideas?

Space and time as perspective would perhaps speak in favour of the latter view, were it not for their origin in the extension and divisible continuity of perceived bodies. It is possible to deny the existence of these bodies or possible knowledge of these bodies, or to say that only our ideas make such knowledge possible. This is idealism. Or we say that it is not important whether bodies ‘really’ exist. Indeed, what does this mean? The important thing is, according to the standpoint taken here, that they do exist in the world we perceive and cognize in controlling it. This is an ‘anti-realist’ view because it displaces reality from metaphysics to experience, cognition, and action; but it is also an ‘anti-idealist’ view because it considers perceived bodies as real as the ideas partaking of their perception. This is how we might reconcile language and thought with reality. We already act, speak, and think in a real world perceived from the perspective determined in a broad sense by our own bodies (cf. Merleau-Ponty 1962: 100, 152). These assumptions of immanence (or ‘inclusion’; cf. Varela 1992: 248) and interaction oppose both the materialist kind of metaphysical realism and Cartesian dualism. For a more detailed discussion of the philosophical implications, see Ch. 1.

According to this understanding it would appear difficult to assess the conception of knowledge emerging (in outline) from the present exploration of time as both experientially and rationally motivated perspective under the traditional dichotomies of oppositions. I have spoken above of developments in temporal studies toward more realistic proposals. What I had in mind is the kind of cognitive-pragmatic realism just explicated. One might thus provisionally understand the perspectivist project in (linguistic) semiotics as representing an experiential-perspectival realism, reconcilable, more specifically, with Putnam’s ‘internalist view’ (cf. Putnam 1981). For a discussion
of the possible invalidation of the idealism-realism opposition altogether, see 1.2, 1.8.

The restricted significance of continuous time or, rather, the space-time of physics, for human perception and the cognition of time, and, accordingly, for a theory of knowledge, was made evident by Carnap’s discussion with Einstein of the very problem that had already worried Aristotle and St. Augustine: the problem of present time (see 4.2, 4.6.6):

Once Einstein said that the problem of the Now worried him seriously. He explained that the experience of the Now means something special for man, something essentially different from the past and the future, but that this important difference does not and cannot occur within physics. That this experience cannot be grasped by science seemed to him a matter of painful but inevitable resignation. I remarked that all that occurs objectively can be described in science; on the one hand the temporal sequence of events is described in physics; and, on the other hand, the peculiarities of man’s experiences with respect to time, including this different attitude towards past, present, and future, can be described and (in principle) explained in psychology. But Einstein thought that these scientific descriptions cannot possibly satisfy our human needs; that there is something essential about the Now which is just outside of the realm of science. We both agreed that this was not a question of a defect for which science could be blamed, as Bergson thought.

I did not wish to press the point, because I wanted primarily to understand his personal attitude to the problem rather than to clarify the theoretical situation. But I definitely had the impression that Einstein’s thinking on this point involved a lack of distinction between experience and knowledge. Since science in principle can say all that can be said, there is no unanswerable question left. But though there is no theoretical question left, there is still the common human emotional experience, which is sometimes disturbing for special psychological reasons (Carnap 1963: 37ff.).

After my presentation above it should be evident that Einstein, like Aristotle and St. Augustine before him, in respect of the “Now”, indeed, was groping after “something essential”, viz., the temporal-perspectival essence of present time. That “Einstein's thinking”, according to Carnap, ”on this point involved a lack of distinction between experience and knowledge” would, in the light of this presentation, rather be to Einstein’s credit. To Carnap’s positivist mind, ”common human experience” in the concept of time is ”emotional” and ”disturbing”, and no theoretical question. This standpoint was articulated (nota bene) not by the physicist but by the philosopher. The pragmatically based, cognitive-metaphorical theory of time as perspective suggested here is confronted above (3.12) with the conceptions of time manifested by classical physics, including the theories of relativity, quantum mechanics and nonequilibrium thermodynamics, respectively. Of a theory of time based on the assumption of a unitary cognitive system one is also entitled to expect the necessary conditions for a corresponding critical assess-
ment of the incoherences still adhering to physical theory as represented by the Newton-Einstein-Bohr-Prigogine line of development.

Theories of time in philosophy and in physics have usually been formulated without consideration of developments in cognitive-pragmatic science and linguistics. The above reflections on time appear to confirm the assumption of its basically perspectival nature and the corresponding need for a theory of knowledge open to an experientially based perspective. Considerations of functions of time in language, especially those related to the aspect category, appear to have enabled a clearer understanding of fundamental metaphorical processes in the perceptual-cognitive derivation of time. These processes indicate the spatial origin of time – in a (derived) phylogenetic, ontogenetic, and synchronic sense: time is a function of space, because it is a function of motion, and motion is a function of space. As distinguished from the primary metaphors of time by which extension and divisible continuity are transferred to space and motion, the metaphor of ’moving time’ has been unveiled as a metaphor of a secondary, superficial nature. The non-discrimination of its proper hierarchical status is understood to constitute the very stumbling-block in the history of temporal studies. McTaggart’s well-known dilemma and the shortcomings of Priorian tense logic can be explained as consequences of this non-discrimination. The present understanding of primary metaphor in the conceptualization of time thus coincides with the suggestion made by Michael Haley (1999) that metaphor apparently must be postulated for much deeper cognitive processes than was shown by the restrictedly conventional use of metaphor forming the base of Lakoff and Johnson’s analysis. The cognitive-metaphorical derivation of time has been demonstrated to proceed from (1) chaos, to which (2) extension, homogeneous divisibility and continuity are assigned for the apprehension/construction of things, space and motion, of which the latter is subjected, in turn, to (3) discontinuation by the heterogeneous analysis implied by temporal-perspectival distinctions; (4) a new, heterogeneous continuity is achieved only by the subsequent synthesis of temporally related instances of motion, i.e. events (see 3.16). The perennial challenge of Zeno’s paradoxes can at last be removed as caused basically by the confusion of (2) and (3).

Further, the important conclusion can be drawn that the hypothetical derivation of time suggested above in the shape of a coherent perceptual-cognitive process can be related consistently to the hierarchy of Peirce’s trichotomy of universal categories (see 4.7). The findings of the previous confrontation of the underlying aspect theory with these categories (Thelin 1994; see below, Ch. 5) have in essence been confirmed. The indexical nature of aspect (and time in general) that was established there, together with further observations, confirms the understanding of temporal analysis as essentially Secondness. Firstness is unrelated and atemporal chaos assigned preperspectivizing homogeneous divisibility and continuity through Thirdness. The resulting continuous motion serves as the basis for operations by
the stable (immobile) instrument of time proper as Secondness, i.e., measurement, localization, and – by way of aspect, tense, and taxis distinctions – perspectival differentiation of events. With regard to aspect, the fundamental situational-aspectual distinction between time-relatedness (i.e., foreground and close background) and non-time-relatedness (i.e., remote background) is itself understood, together with its negative member (remote background), to pertain basically to Thirdness. The positive member, i.e., foreground and close background, and its subordinate realization through the event-aspectual distinction, represented by +TOTALITY and –TOTALITY, respectively, clearly pertain to Secondness. The demarcation of the two latter Peircean categories should not be absolute, however, but hierarchical-successive in nature. In the integration of temporal-perspectival analysis with change-of-state and cause-effect analysis, for example, we probably have to assume a dynamic transition from Thirdness to Secondness.

The crucial role played in the process of temporalization by the concept of continuity as well as the hierarchy of its transformations suggested here are findings shown to be reconcilable with Bhartrari’s ‘four views’ as well as with separate observations made, for example, by Aristotle, Spinoza, Locke, and Bergson. As we have seen, they are also strongly supported by the general principle of synechism and the trichotomy of universal categories postulated by Peirce.

Quid est enim tempus? ‘What is time then’? May we, in good conscience, maintain that today we know the answer to St. Augustine’s question? I don’t believe so. There is, obviously, still a long way to go. It would be gratifying though if these reflections prove to have brought us somewhat closer to a position from which we may better survey the landscape of time and ask further essential questions about its topography. At this stage of exploration the provisory answer to St Augustine’s question would take, as a starting point, the central conflict between chaos and order. One would point to man’s need for order to survive, to his corresponding urge to discover such order in chaos or to create it where there is none; to control the actual order, or state of affairs, and react properly to any change in it.

To establish order, man, as suggested by Peirce (CP 1.383, 2.778), apparently needs the strategy of diagrammatic patterning of the world observed. This strategy is represented in the proposed model by the primary (biologically motivated; see 2.2, 2.4, 3.3, 3.8, 3.11) assignment of extension, divisibility and continuity to matter and, by way of subsequent metaphors, to space and motion, as well. The homogeneously divisible continuity of (potential) courses of events thereby effected is a prerequisite for their analysis (discontinuation) into heterogeneous segments by discerning particular events and assigning to them change-of-state and cause-effect relations. It is as part of this very analysis that time proper enters the picture, and does so as a genuinely perspectival manipulative device, i.e., primarily as aspect. It is encouraging that Esa Itkonen (1999) in his fundamental treatment of reanal-
ysis and extension/analogy as means of grammaticalization has furnished independent evidence precisely for a hypothesis deriving time from matter (body) and space by successive metaphorical 'shifts' (underpinned, in turn, by his reference to equivalent findings in Heine et al. 1991: 41).

With the aid of cumulated and coordinated knowledge from previous experience (in a broad sense) and the assessment of the actual situation we interpret a course of events primarily according to a corresponding distinction between non-time-related, i.e., remote background, events, on the one hand, and time-related, i.e., state-changing foreground events or close background events, on the other. The fundamental nature of this opposition is also attested by its applicability to, for example, the distinction between ‘simple’, i.e. actual, and habitual iteration illuminated by David Danaher (1999).

State-changing foreground events can be discerned and ordered in regard to cause-effect only by way of their delimitation and isolation in the course of events. The corresponding temporal perspective is represented by the time-related aspectual feature of totality (+TOTALITY). Events viewed not in their totality but merely in one (or, potentially, more) of their parts, defined by (correlated to) state-changing foreground events or other points of reference (among them the moment of speech), are ongoing processes and belong normally to what I call close background. This temporal perspective is represented by the time-related aspectual feature of partiality (–TOTALITY), suggested originally in Thelin (1978a).

In cases of aspectual time-relatedness and non-time-relatedness, if in the latter case the degree of abstraction does not preclude such a distinction (as it does, for example, in the ‘eternal present’), events are distinguished further from the perspective established by the moment of speech, i.e., as present, past, or future tense, respectively: –PAST, –FUT (= present); +PAST, –FUT (= past); –PAST, +FUT (= future).

In cases of compound events, tenses are modified further by the temporal-perspectival distinctions of taxis, viz., the moment-of-speech independent oppositions +/-ANTEOR and +/-POSTERIOR. As I have shown elsewhere (Thelin 1991a; see also Ch. 9), this application of taxis to tense appears to shed new light in particular on the traditionally problematic system of perfect meanings.

*Measure* of time is based on delimitation of events by way of aspectual totalization. Temporal *localization* is based on the correlation of events to each other in either the total or partial time-related aspectual perspective. In cases of chronological measure and localization, reference events are conventionalized as either ‘points’ or ‘stretches of time’.

I conclude that temporal processing can be assumed to imply not only fundamental features of human thought and linguistic implementation but also higher-order strategies of perception. In view of the corresponding role that should be ascribed to time in a general theory of action/interaction (in-
cluding verbal interaction) we may expect a new understanding of time based on language to bring about a new understanding of knowledge as well. Time as perspective, for one thing, is a challenge to the idea of absolute knowledge. Thinking and its basis in knowledge as personal experience (including idiosyncratic emotions, values, needs, interests, intentions, expectations, preferences, and so forth), as memory and actual situation analysis, accordingly, appear to be characterized not only by collectivity and conventionality but also by considerable individuality.

Theories of time claiming some degree of universality and corresponding interdisciplinary adequacy cannot, apparently, any longer avoid facing the questions raised along these lines by a coherent, cognitive-pragmatic analysis of temporal processing in language. However, the great challenge facing cognitive-pragmatic science itself is the task of integrating a theory of perspective, not foreseen by Peirce, with functional semiotics and a corresponding dynamic theory of knowledge (see 3.2, 3.8–10, 3.13).
5 The category of verbal aspect and Peirce’s theory of signs

5.1 Language as a system of sign operation

Recent developments toward cognitive-processual models of linguistic functions and their integration with pragmatic conditions may, in important respects, be said to have been anticipated by Charles S. Peirce’s theory of signs. Representing in essence a pragmatically based theory of cognition (Fitzgerald 1964), Peirce’s teleological, triadic understanding of semeiosis (Savan 1976; Parret 1983; Shapiro 1983), and more specifically, his concept of INTERPRETANT as a mental activity of interpretative translations mediating between SIGN and OBJECT, indeed expressed an advanced hierarchical-operational view of the systemic relations between expression-form and content-form in language.

Although proceeding primarily from the interpretative ‘effect’ of signs upon the interpreter, which applies to processes of linguistic decoding, Peirce’s dynamic, hierarchical-componential understanding of thought-signs (CP 1.284–289; 5.284; 7.351ff.) also allows of a corresponding treatment of the operations underlying the processes of encoding, i.e., linguistic signification proper. Thereby it suggests a general basis for semantic theory. This evaluation of Peirce’s semiotic is supported by the fact that it also includes in a coherent way a component of perception (CP 5.115, 151, 182) which was subsequently recognized by linguists for its impact on the structure of meaning (Miller and Johnson-Laird 1976; Jackendoff 1978; Bierwisch 1980a; Bierwisch 1980b; Thelin 1985: 162ff).

Against this background, it appears meaningful to investigate to what extent empirical support for current linguistic theory may be established by reference to its systematic equivalents in Peirce’s semeiotic distinctions. As an alternative to the prevailing actional-semantic and semantico-syntactic understanding of (verbal) aspect in the Aristotle-Ryle-Kenny-Vendler-Dowtyan […] tradition, the present treatment proceeds from a pronounced temporal-perspectival view and intends to shed some light on the cognitive-pragmatic correlates of the semantic distinctions realized by this category. I have thus chosen to base the following observations of the aspect category – in traditional grammar represented by the distinction between perfective vs. imperfective verbs – on an integrated understanding of grammar, embedding
language as a sign operating system in the continuum of human perception, cognition, and physical action / interaction (including verbal action / interaction; see 3.2).

For this purpose let us assume that the path of sense-making thought can be likened to an infinite process of sign production and reception that is generated by human emotions, values, needs and desires, and by the satisfaction of these, and that is pursued by activities of individuals within a community on the basis of present and past experience. More specifically, this process may be assumed to have the shape of a hierarchically ordered, goal-oriented succession of evaluative decisions mediating between signans and signatum, and interpreting in this way the relation between the latter in terms of binary choices. The idea of cognitive oppositions had, as a matter of fact, been suggested by Peirce himself as "a very pivot of thought" (CP 1.324ff.), although he restricted the idea to his universal category of Secondness. In its broader application, binarism is thus understood here to be based on cognitive components of an oppositional nature functioning as abstract (deep structure) signs and determining one another, implicitly, by way of (minimal) resemblance (CP 1.566–567; 7.349; 5.162; Wittgenstein 1960b [1914–16]: 183). In a more fundamental sense, though, binary cognitive features define linguistic signs by way of inclusive differentiation (Thelin 1987: 106–107; see 1.3), reflecting the 'asymmetric nature' of linguistic signs as suggested by Karcevskij (1929).

One basic feature of sign interpretation appears to be its constant operational access to past significative experience in treating current significative experience. This feature allows of the hypothesis that sign interpretation (in decoding as well as encoding) may be modelled adequately in the form of a circular feedback process of constructive, pattern matching search operations (Thelin 1985). The latter would be based on cognitive decomposition as the decisive strategy for handling the reception, storage, and retrieval of significative data: “A large, and maybe the biggest part, of the business of our understanding consists in the decompositions of concepts” (Kant 1899 [1787]: 47). It appears reasonable that the principle just assumed for the everyday significative life of verbal communication should allow of an abstraction so as also to apply to the meta-level of significative life represented by the historical process of theory formation in language semiotics, as the vehicle of any epistemology. Indeed, the latter process is reflected in part by the former assumptions. Therefore I consider it useful, for the restricted purposes of the present discussion as well, to provide at least a certain amount of feedback from the past experience of meta-significative life.
5.2 On the cognitive-pragmatic nature of Peirce’s *interpretant*

It is no secret that Peirce’s operational concept *interpretant* as the important basis for his dynamic-creative view of language was criticized for making logic a question of psychology. This criticism was refuted by Peirce himself (CP 5.110) who – in harmony with his view of pragmatism as a logical and semiotic doctrine – maintained that “logic does rest on certain facts of experience among which are facts about men, but not upon any theory about the human mind.” It is remarkable, therefore, that Morris (1946: 27, 287ff.) after having refined – under the very influence of Peirce – his originally simplistic behaviourist approach to semiotics (in its pragmatic aspect; cf. Morris 1971 [1938]: 44ff.), found it meaningful to continue this criticism by giving explicit preference to Peirce’s "emphasis upon behaviour" as distinguished from his "more mentalistic formulations".

Proceeding from his "bio-social" understanding of psychology, Morris (1946: 230) apparently did not fully recognize the cognitive status of the logical-abductive operations implied by Peirce’s concept of *interpretant*. Although Morris adopted this term, as well as Peirce’s general pragmatist framework (cf. Parret 1983: 11, 103), he still reduced its inherent dynamism to a matter of “disposition to respond”, accommodating it to the static two-term relations between *stimuli* and *responses* (Morris 1946: 30, 288) rather than acknowledging its nature of hierarchical-processual mediation fulfilling, by way of cognitive operations, the function of goal-oriented, creative-evaluative interpretation (see also 1.10 and, in contrast, the discussion of Dewey in 3.3).

It is true that Morris introduced a descriptive framework “for the differentiation of modes of signifying in terms of differences in interpretants”, which he conceived of as “tendencies to respond” (Morris 1946: 62). The latter formulation could, indeed, be compared to Peirce’s concept of *Habit* (and Thirdness) applied to interpretants, but it is important to note that (except for a few cases where hierarchization in interpretants is indeed suggested; ibid.: 157, 165), Morris’ approach to semiotic relations remains static-structural rather than processual-analytical. This drawback remains, in spite of his important endeavour to integrate his previously distinct aspects of semiotics in terms of *pragmatics, semantics* and *syntactics* (Parret 1983: 11, 103). Although Morris does make use of the concept of ’sequentiality’, he restricts its application to superficial responses (Morris 1946: 12). It seems, indeed, as if the hierarchical-processual nature of signification is in a way latent in Morris’ conceptual framework, suppressed by his tacit avoidance of any explication of the concept of *mediation* that might be related to a chain of sign-interpreting operations and thus identified with the ’mentalist’ concept of *associative thought* (CP 5.284).
In this light, Morris’ criticism of Peirce’s ‘mentalism’ could probably be reduced to a matter of terminological dispute, although it may also reflect an objectivist attitude originating in remnants of logico-empiricist philosophy (Parret 1983: 103). As pointed out by Parret (ibid.: 105; my emphasis), “as against mentalism and psychologism, the interpretive aptitude is recognized only as finality or as action. […] Indeed, pragmatically based semiotics is, in fact, a logic of action, especially the action in thoughtful discourse.”

5.3 Peirce’s logic of action and the development of functional grammar

Understood thus as “a logic of action by interpretation” (Parret 1983: 93), Peirce’s conceptual framework, indeed, anticipated developments in linguistics that have moved away from the static character and autonomy of axiomatic structuralism (represented by the Saussure-Hjelmslev tradition) toward the dynamism and hierarchical coherence pursued by truly functional structuralism in processual models of language based (as distinguished from Transformational Grammar) on the structural primacy and cognitive (cognitive-pragmatic) dependence of semantics. One of the earliest and most courageous advocates of this orientation was Wallace Chafe (1970). One recent, and most instructive, example of this development is furnished by Michael Fortescue (2001) who opens our eyes to central ideas in Alfred North Whitehead’s philosophy of mind in ways that link it most naturally to Peirce’s cognitive-pragmatic philosophy. Both stress the significance of hierarchy, process, and teleology in human thought. Perception is integrated by both thinkers, though not interrelated with action by Whitehead in the elaborate way it is by Peirce in his framework of abduction (Thelin 2002; see above, Ch. 3). The pragmatic perspective is thus less developed in Whitehead’s philosophy. This also holds for the biological perspective that is to some extent present in Peirce in his observations of evolution, albeit without the fundamental role ascribed to it in the philosophy of biopragmatism suggested above in outline as the basis for our understanding of perception, action, thought, and language. It is noteworthy, however, that the crucial phenomenon of biological rhythmization, suggested here as a precondition not only for spatial/temporal analysis but for attention and perception in general, as well as for action, was also reflected by Whitehead’s observation of the ‘natural rhythm’ in individual occasions of experience (Fortescue 2001: 236).

It is important to recognize that – parallel to the suppression of corresponding tendencies in Morris – these developments were already pre-programmed in American as well as European structuralism by the idea of hierarchization introduced, for example, by Bloomfield’s concept of
'artificial basic forms' and Trubetzkoy’s 'archiphoneme' within predominantly taxonomic-distributional frameworks.

The decisive step from 'item-and-arrangement' to 'item-and-process', however, was never taken by classical structuralism. Even Roman Jakobson (1948; 1971 [1957]), although his postulation of abstract underlying morphological units and corresponding rules for the analysis of the Russian verb indeed presupposed processuality and thus was a challenge to traditional distributionalism (Thelin 1975: 152ff.; 1978b: 243ff.), seemed to hesitate as to the consequences of his proposals for the further development of linguistic theory. Although the concepts of hierarchy and process were present in his writings (Jakobson 1971 [1936]: 35; 1971 [1957]: 143), he never applied them in any coherent fashion in his descriptive models. The latter circumstance is evidenced, for example, by the fact that his rules remained unordered (Thelin 1987: 92). The reason for this ambivalence may – similar to the case of Morris – have been the tacit avoidance of a possible association of hierarchically ordered ‘grammatical processes’ (cf. Jakobson 1971 [1957]: 43) with an assumption of corresponding cognitive operations.

However,

[H]ierarchy is possible only through construction, through operation […] Operation is the transition from one element to another in a sequence of forms. Operation and sequence of forms are equivalents (Wittgenstein 1960b [1914-1916]: 164, 174).

One of the first linguists to express more explicitly a corresponding idea of language was, in fact, Émile Benveniste. He maintained that

[N]othing prevents us from believing […] that linguists in language structure will find laws of transformations [compare Peirce’s ‘Habits’; NBT] similar to those which allow one – in the operational scheme of symbolic logic – to proceed from one structure to another derived structure and establish constant relations (Benveniste 1954: 50).

Long before Benveniste, scholars like Wilhelm von Humboldt (1876: 79–80, 99–100), Edward Sapir (1921: 138) and Ferdinand Brunot (1936 [1926]: XII, XX) certainly had expressed in various ways the dynamic understanding of language as the translation of concepts into linguistic symbols. Indeed, not unlike Peirce, Humboldt had seen language as purposive, creative action.

While acknowledging the importance of Jakobson’s ‘discovery’ of Peirce and his prediction of the epochal role to be played by his semeiotic thought for the development of linguistic theory (Jakobson 1971 [1965]: 346; Shapiro 1983: 6ff.), we must not overlook the fact that Jakobson’s rather modest interest in Peirce’s distinction between icon, index and symbol, and, particularly, his preoccupation with the concept of iconicity, was bound to
neglect the creative, hierarchical-processual view of sign interpretation so essential to Peirce’s semeiotic thought and so crucial to the current development of linguistic methodology.

The latter view was, I believe, already conveyed in a pertinent way by Wittgenstein's (1960b [1914–1916]: 183) statement that "the concept of operation is, in general terms, the one through which signs can be formed according to a rule.”

5.4 On the status of iconicity in the category of aspect

It is not surprising, therefore, that the very first attempt to connect Peirce’s semeiotic with temporal meanings relatable to the grammatical category of aspect was undertaken by Jakobson (1971 [1965]: 350) precisely in terms of iconicity (cf. Hopper 1979: 214; Shapiro 1983: 4; Haiman 1985: 4, 89–90, 100–102). By applying the concept of icon to the overt correlation of temporal order between speech events and narrated events (his example: *Veni, vidi, vici*), he suggested that the latter are ‘mirrored’ by the former, i.e., that "the relations in the signans correspond to the relations in the signatum.”

This observation of Jakobson’s is important, and it is supported by his reference (Jakobson 1971 [1965]: 350) to Peirce’s general statement that "the arrangement of the words in the sentence […] must serve as icons, in order that the sentence may be understood.” However, the iconic function observed appears to have a restricted validity. If one overlooks the complications caused by typological and language-specific differences in word order, one may agree that syntactic order as an icon of temporal-logical order certainly is no coincidence. It is dependent, however, on the obligatory linearity of speech. Due to the latter, syntactic order must prevail also where no corresponding temporal-logical order is at hand, for example, in cases of simultaneous events. Here iconicity is ruled out, at least in regard to temporal relations.

More problematic, however, is the fact that this kind of inductive application of Peirce’s semeiotic (i.e., in terms of a static one-to-one relationship) – although understandable especially in regard to iconicity – misses the crucial relation of signans and signatum to the dynamic concept of interpretant in his triadic system of sign function. Without the assumption of a corresponding interpretative-transformational history of such linguistic expressions as *Veni, vidi, vici*, the latter remain cognitively unrelated to their broader, situationally motivated temporal-perspectival function in discourse and corresponding semantic essence; i.e., from a pragmatic-semiotic point of view, the very heart of aspectual distinctions (cf. Kamp 1979: 381, 401, 407–409). Now, Jakobson’s observation was certainly not intended to contribute to aspectology, but de facto it suggested that aspect, since unambiguously conveyed by the overt temporal succession of events, involves in some non-
trivial way the function of icon. That this idea is not a mere hypothetical construction is evidenced by its appearance in subsequent aspectological work (Hopper 1979: 214; 1982: 15).

Haiman’s (1985: 4, 100–102) attempt to associate (by referring to Hopper) simultaneity (understood by him as aspect) and backgrounding along a second axis of prominence (in addition to the ‘axis of time’) does not, apparently, justify his conclusion that “languages may also iconically display simultaneity.” On the contrary (as observed by Haiman himself; p. 89ff.), some languages in cases of simultaneity will even formally ‘deny’ iconicity. Haiman’s conclusion apparently overlooks two important conditions, viz., that (a) simultaneity is not itself aspectual but rather contextually derived from aspect proper and thus is just one of the possible meanings implied by backgrounding (and is so only in cases of time-related, so-called close background; see 3.12), and (b) prominence (i.e., according to Haiman, simultaneity rather as ‘non-prominence’) is conveyed, thus, in such cases not by way of any mirror-like linguistic projection of ‘real’ events (as suggested by his application of icon here) but rather by the subject-dependent perspective, i.e., the aspectual status assigned to them by the speaking subject. What Haiman suggests is, in fact, that his application of icon to ‘tense’ (in cases of succession; p. 89) should also be expanded to aspect (in cases of simultaneity). It is difficult to see how this would work. It is quite another matter that simultaneity may be expressed by the subordinate temporal category of taxis (see 4.2, and Ch. 9) in cases of –ANTERIORITY and –POSTERIORITY. These features operate on superordinate aspect (mediately) and tense (immediately) and are not known to display any iconicity in linguistic surface structure.

In fact, the concept of icon does not seem to encompass in any straightforward sense the more essential semantic relations between aspect expressions and their underlying content of temporal-perspectival analysis as integrated part of the broader situation analysis and reflected thus by causal-temporal coherence (Kant 1899 [1787]: 218–226) in discourse. How, for instance, could the concept of icon help us derive (see below Section 5.6, Figure 6 a) in a corresponding, logically coherent way, temporally successive events from their underlying function of situational change-of-state (cf. von Wright 1963; 1967) and their corresponding foreground function in discourse and predict their typical realization through perfective aspect forms in Slavic, simple forms in English, and passé simple in written French?
5.5 Aspect as temporal perspective: the distinction between symbol and index

Apparently, the latter condition can only be handled adequately if we assume that the capability of events to be ordered is determined by a distinctive component (or abstract sign) ascribed to them (in constructing them) on a given cognitive-semantic level in logical-interpretative coherence with the perceptual distinctions operated in the situational-perspectival analysis (see 3.8–9). The qualification for such an equally perspectival, i.e., aspect-semantic, component is not fulfilled by the concept of icon, but rather – as we can see in Figure 5 – by the indexical feature of totality, viz., as means of delimitation.

![Figure 5. Symbolization and Aspect as Temporal Index](image)

Indeed (as demonstrated by the simple tree of derivation in Figure 5), while iconic relations seem to be of restricted scope in the grammatical category of verbal aspect, one would rather expect its perspectival nature to favour indexical relations (cf. Parret 1983: 124). In agreement with the theory of aspect underlying the present observations (cf. Thelin 1978a; 1980; 1984a; 1984b; 1985; 1986; 1990a; 1990b; 1991b; 1994; 1999; 2002), the primary cognitive-semantic distinction of temporal perspective applied to (individual) events would thus determine whether they are either symbolized AND indicated as existent ‘in time’ (i.e., +TEMPORAL INDEX) or merely symbolized (–TEMPORAL INDEX). The latter non-time-related perspective is typically realized in propositions of a general nature, pertaining to events simply stated or described as habits, backgrounded iteration, generic or gnomic features, etc. (for interesting observations in this connection, see Wittgenstein 1969: 216–217). If viewed as existent ‘in time’, however, events are analyzed further in a rather localistic way reflecting their perception in terms of wholes and parts (in accord with Gestalt theory; see 3.8).
That is, reference is made to them either (a) in their entirety (+TOTTALITY) and thus delimiting them from each other as a prerequisite for their being sequenced, or (b) in one or (potentially) more parts or phases of continuity (~TOTTALITY, i.e., ‘partiality’), conveying in the latter case the sense of on-going process.

Realizing the distinction between Peirce’s concepts of symbol and index (as well as their coexistence, here in time-related events) rather than icon, the simple tree of deductive interpretation in Figure 5 is assumed to comprehend the cognitive-semantic essence of aspect understood as temporal-perspectival device in a universal sense. Typological and language-specific variation is treated, accordingly, as pertaining merely to surface conditions such as different strategies for balancing situational/contextual predictability and formal redundancy (Thelin 1986: 219–221) as well as to the morphosyntax of (very often polysemous) aspect expressions (compare in Figure 6 below the corresponding conditions adduced for Slavic, English and French).

5.6 Toward a cognitive-pragmatic model of aspect

As indicated already and now developed further by Figure 6, the process of aspectual-semantic interpretation of individual events (according to Figure 5) has to be integrated into the broader cognitive-pragmatic process of situation analysis and the corresponding temporal-perspectival organization of discourse (for a detailed account, see Thelin 1990a; see also 3.13, 3.16, 4.2, 4.8). This process is assumed to be based on the distinction between phasal and non-phasal situations (i.e., motion vs. rest, or, in conventional linguistic terms, activity vs. state) and a subsequent set of change-of-state distinctions. The inclusion of change-of-state distinctions may be understood here to represent an abstraction from originally spatial distinctions in the temporal-perspectival analysis of situations in terms of the foreground-background distinction, viz., of the import that changes in general are distinguished according to their distance from and corresponding degree of relevance (actuality) for the observer in a given spatially defined situation. At first glance the inclusion of change-of-state distinctions might make the traditional foreground-background distinction appear superfluous. The distinction between change-of-state and non-change-of-state is indeed correlated to foreground and background, respectively; equally, the distinction between change-of-state-relatedness and non-change-of-state-relatedness is correlated, I suggest, to the further differentiation, missing in traditional aspectology, viz., between close background and remote background, respectively. However, these correlations, in my view, are not yet sufficient to disqualify the foreground-background distinctions as realistic cognitive (perceptual-cognitive) components of temporal-perspectival processing. The assumed origin of temporal perspective in spatial perspective, and the corresponding perceptu-
al-cognitive interdependence of space and time in physical action, speak in favour of keeping – until further empirical evidence is available – the foreground-background distinctions along with the change-of-state distinctions as mutually complementary features. For one thing, the transition from situational-perspectival analysis to event-perspectival analysis can, according to the proposed model, take place in a cognitively coherent way only if we assume that the distinction between foreground and close background is realized by the event-aspectual distinction introduced above, viz., between a total (+TOTALITY) and partial (–TOTALITY) view of events, respectively. This typically spatial-indexical feature also speaks in favour of the remaining spatiality-indexicality of situational-aspectual distinctions, all the more for this feature having been shown above (3.8–9) already to partake, by way of processual feedback, in change-of-state and cause-effect analysis. As can be seen from the examples in Figure 6, the perspectival distinctions discussed are demonstrated here by the phasal situation (non-stativity) of 'smoking' and the two non-phasal situations (stativities) of 'being' and 'knowing'.

\[\text{Figure 6. Phasality, Change-of-State, and Aspectualization}\]

The model illustrated here (which varies that of Figure 3 in 3.13) is restricted to the past tense, but it can basically be extended to the present and the future tenses as well. To the generally free combinability of aspect features
and *tense* features (+/−PAST, +/−FUT) there is one exception, viz., the natural, but not always discerned incompatibility of +TOTALITY and the present tense (i.e., −PAST. −FUT) meaning (see 3.12, 4.8). This incompatibility can be explained simply by the underlying pragmatic-perceptual condition that events taking place simultaneously with the moment of speech are not as a rule surveyable in their entirety but can be referred to only in regard to that very part or phase of their development that coincides with the moment of speech (i.e., in terms of aspectual partiality: −TOTALITY). That is why English (aspectually polysemous) simple forms in the present tense normally express non-time-related meanings (such as, for example, habituality) and are capable of expressing time-relatedness and totality only in cases of so-called ‘temporal transposition’ such as the reportative and performative uses (Thelin 1982; 1990a, 1991b).

Furthermore, this model can easily be integrated with the temporal-perspectival category of *taxis* (i.e., the oppositions +/−ANTERIORITY, +/−POSTERIORITY), realized mainly in the so-called ‘perfect’ system by the feature +ANTERIORITY in the combined tense-taxis meanings of the pluperfect, the present perfect, and the future perfect (Thelin 1991; see Ch. 9).

By extending the range of application from simple to complex text structures, the model allows of the *hierarchical embedding* of superficially contradictory feature combinations, as in cases of non-time-related events when realized, for example, in Czech habitual expressions or Russian proverbs by perfective aspect forms (conveying +TOTALITY), assigning to them an aspectual meaning of concrete exemplification, though subordinate to the situationally given meaning of non-time-relatedness, i.e., remote background (Thelin 1985: 189ff.; 1990b).

Whereas, in the circular feedback model, the superordinate situational distinction +/−PHASAL SITUATION apparently is only mediately dependent on cognition, change-of-state conditions are immediately dependent on the cognition of the temporal-perspectival analysis of situations and events (according to cause-effect analysis and intentional dependence). For example, what to someone may be a state-changing foreground event, to someone else could very well appear to be just part of a process related directly to the foreground, but not qualifying as a new state of affairs (i.e., rather close background); or it may even be viewed as a remote background condition only indirectly related to the foreground.
5.7 Summary

It now appears possible to conclude that an aspect theory such as the one suggested in outline by Figures 5 and 6 is supported not only by Peirce’s distinction between symbol and index (as well as their coexistence), but, as we shall see, also by his trichotomy of universal categories in terms of Firstness, Secondness and Thirdness (see also 4.7).

The cognition of events according to the distinction +/–PHASAL SITUATION – itself a transitional one (cf. Kant 1899 [1787]: 173) – can, in agreement with the principle of subject-object interaction (see 1.5–6), be assumed to be determined in part by their physical nature or, according to Peirce (CP 1.302ff.; 7.625ff.), by the independent ‘Qualities’ of Firstness in immediate perception. This might, under certain circumstances, be understood in such a way that phasality (divisible continuity) as Thirdness (Habit) is implied by biologically-rhythmically motivated homogeneous divisibility assigned to chaos (as Firstness) in those cases where it applies, viz., to segments judged by way of feedback – i.e., in logical-hierarchical coherence with change-of-state, cause-effect, and temporal-perspectival analysis – to be potential activities (since states are not subjectable to divisibility; see 3.13, 4.6.1, 4.6.4.1). Consequently, this also allows mediately of the dependence of phasality on idiosyncratic interpretation, that is, what to someone appears to be an activity may to someone else be a state of affairs without potentials for immediate change, and vice versa. The analysis of change-of-state and cause-effect conditions, and, hierarchically integrated with it, the temporal-perspectival analysis of situations and individual events, may thus be said to involve not only processes of such higher degrees of cognitive dependence ascribed by Peirce to Thirdness but also processes related, in a hierarchical-integrative fashion, more closely to perception, that is, pertaining rather to Firstness and Secondness (see 4.7).

This interpretation appears to be supported by further evidence. Peirce’s understanding that Firstness is “without parts” and that Secondness implies “modification” (NEM 4.332) agrees perfectly with my assumption that phasality (as continuous Third), having been applied to First, is subjected to partitioning (the heterogeneous kind of discontinuation; cf. Bergson 1911b: 32, 30; Thelin 1990b) by the aspectral-semantic analysis in terms of the distinction +/–TOTALITY as Second. As a subsequent specification of the superordinate interpretation +TEMPORAL INDEX, the features +TOTALITY and −TOTALITY conform further to Peirce’s concept of ‘Pairedness’ as synonym for Secondness, viz., “[that] which belongs to one subject in one way and to the other in another way” (NEM 4.332–3). In addition Peirce says of one of the two modes of ‘definiteness’, which he ascribes to the percept (as distinguished from the perceptual judgement; see 3.2), that it is “perfectly explicit”. This explicitness is conveyed precisely by the perceptually based but cognitively dependent distinction +/–TOTALITY as repre-
senting Secondness. The superordinate distinction \(+/-\) TEMPORAL INDEX, however, as the result of further generalization conforms as such rather to Peirce’s concept of perceptual judgement and would thus be closer to his category of Thirdness. This condition would, as indicated already, apparently pertain as well to the distinctions implied by change-of-state and, especially, cause-effect analysis to the extent that they are based on habit and convention.

If we now proceed to the level of events resulting from the perceptual-cognitive operations reflected by Peirce’s trichotomies of categories and signs (in their relations to their objects), i.e., if we consider the resulting narrated events (compare the English examples in Figure 6), then we may in a corresponding way ascribe regularities to them, or, in the terms used by Peirce, ‘final interpretants’ in conformity with his universal categories and his corresponding trichotomy of signs, considered now as they are in themselves, viz., as qualisigns, sinsigns and legisigns.

Accordingly, time-related events that appear in the foreground and close background of discourse represent Secondness and function as sinsigns, i.e., they typically convey such concrete meanings as contiguity, limitation, singularity and actuality (CP 1.24–25; Shapiro 1983: 30, 34). Applicable directly to this interpretation is Peirce’s definition of sinsigns as “an actual existent thing or event which is a sign” (CP 2.245).

Under these conditions, non-time-related events that appear in the remote background of discourse most naturally conform to Peirce’s category of Thirdness and function, accordingly, as legisigns, i.e., they typically convey such meanings of abstraction as universality, generality, law, rule, permanent state and habit. Peirce’s formulation “Action is second, but conduct is third” (CP 1.337) may thus be equalled to the classical distinction between narratio and descriptio as the two modes of literary design, correlated in turn to the two temporal perspectives of foregrounding and backgrounding, respectively (Thelin 1984b; see 8.4.10.3).

An important conclusion that we may draw is (as indicated already; see 5.4) that Peirce’s concept of icon is not apparently constitutive of aspectual-semantic distinctions as such, but involved here only in the elementary sense of Firstness expressed by him (CP 5.119) so that “every symbol must have its Indices of Reaction and Icons of Quality.” In our case iconicity would then pertain to the relation between the primitive perception of events as Firstness and their perceptual-cognitive transformation assumed by the ‘transitional’ distinction \(+/-\) PHASAL SITUATION as Thirdness and subsequent temporal-perspectival distinctions either as Thirdness (of primary binary choices) or, in cases of \(+\) TEMPORAL INDEX (time-relatedness implied by \(+\) CHANGE-OF-STATE/foreground and \(+\) CHANGE-OF-STATE-RELATEDNESS/close background), as Secondness.

The framework sketched above for a theory of aspect in terms of temporal perspective (rather than in traditional terms of actional-semantic or semanti-
co-syntactic conditions) may, thus be said in non-trivial ways to be evidenced empirically by the very core of the semiotic distinctions postulated by Peirce. The systematic nature of this evidence follows from the condition that his observations of relevance for the cognitive semantics of aspect originate in these basic distinctions rather than in his non-systematic treatment of the concept of time. Time is of concern to Peirce mainly as constitutive of the process of thought itself (CP 7.346–353), including the important concept of change. His preconception of time as true continuum (see 4.7), that in a sense anticipated Bergson’s distinction between intuitive and spatialized time (Bergson 1911b: 32), is reconcilable with the process of heterogeneous discontinuation of phasal (continuous) situations by way of aspectual totalization/partialization as temporalization proper, provided its reinterpretation in the hierarchical-processual model above.

To sum up, it appears reasonable to establish that the application of Peirce’s semeiotic to the grammatical category of verbal aspect as a central issue of linguistic research (Thelin 1990a) has revealed important equivalents of a basic epistemological (perceptual-cognitive) nature to conceptions in the aspect-theoretical framework considered above. It would be encouraging if these observations also received some attention beyond aspectology. They might then corroborate – in more dynamic ways than could be foreseen by Jakobson – the qualities of Peirce’s semeiotic thought as empirical guidance for the development of the cognitive-pragmatic foundations of linguistics.
6 Time and empathy: the Other’s perspective on change, and Husserl’s phenomenology

The dependence of time perception on the individual’s perspective is something we experience in various situations and phases of life. That the Other’s thoughts about what takes place in reality in a corresponding way are accessible to us only if we are able to adopt his/her temporal perspective is a condition that may not at first be obvious. Neither idea has a long tradition in philosophy. Let us examine how the matter stands.

When the Pre-Socratics denied the existence of time and Plato referred it to the world of phenomena dependent on opinion (doxa), this was an expression of the idea that reality is unchangeable. Still, Plato laid the foundation for the understanding of time as a human construction. What he overlooked, however, as did Kant later, was its intersubjective functioning.

The dependence of time on the individual’s perspective is obviously more essential than indicated by the notion of ‘subjective time’, usually ascribed to those kinds of time perception that do not find a place within allegedly ‘objective’, mainly physical, theories of time. Einstein’s worries about tense meanings have been evidenced above (3.12, 4.8).

If we except the present perspectival conception of time with its roots in American pragmatism, it is, actually, only in the context of Edmund Husserl’s phenomenology that the important interplay of time perception and the Ego’s relation to the Other has been paid proper attention. This holds to a particularly high degree for Daniel Birnbaum’s (1998) treatise on *The Hospitality of Presence: Problems of Otherness in Husserl’s Phenomenology*.

More generally, the starting-point for research along these lines is Husserl’s (1913) theory of the Subject. This theory also includes the concept of time since it is based on the thesis of the Ego’s consciousness of its own Presence as a point of departure for all other consciousness, as the “principle of principles”. The temporality of the Ego is thus implied by its consciousness of its existence in the superordinate Now. Whereas Descartes (see 2.4) inferred our existence from our consciousness (*Cogito ergo sum* ‘I think, therefore I am’) in an absolute way, Husserl treated it as an expression of our acts of consciousness. No reality beyond these is up for discussion. Existence to Husserl is the Subject’s self-presence in a stream of consciousness that moves from one moment to another, and thereby also constitutes the stream of original time consciousness (cf. Husserl 1966 [1893–1917]: 72–75,
370; cf. also 477; see the discussion at the end of this chapter), as reflected by the continuity that, according to the model proposed here, precedes and enables the constitution of time proper, like, for example, the present (Presence) related to the past and future. When Husserl integrates the classical metaphysical question of Being with his Subject and its consciousness, he also modifies the latter’s relevance, as demonstrated by Birnbaum, by ultimately relativizing the absolute nature both of Presence (the Now) and the Subject. Both are ‘opened’ to ‘what is not’ Presence, and ‘what is not’ the Ego, viz., to the Other.

According to Husserl’s pupil Martin Heidegger (1953), the connection between Being and Time was the main thread running through all of Western philosophy. He never succeeded, though, in offering an unambiguous interpretation of this relationship. Heidegger substituted the Ego and Presence, which in his view convey a thinglike understanding of Being (Sein), for the notion of Existence (Dasein) as a more proper expression of the Subject as ‘being’ (Seiend), i.e., as a consciousness of its own Existence. However, Being at this level, according to Heidegger, is not the last resort of thought as maintained by previous metaphysics (including Husserl). He postulates thus a more abstract level of Being in the shape of a superordinate system of possibilities of meaning without which, in his view, one Being cannot interpret (auslegen) itself or other Beings.

It is at the latter, very abstract level of Being that Heidegger locates original temporality (Zeitlichkeit) as the precondition for all existence (see 4.1). He thereby breaks – as did Kant through his a priori conception of time – with traditional metaphysics. However, whereas Kant by virtue of his constructive ‘Copernican turn’ views time as a necessary form of apprehension, which the subject imparts to his sensory experiences in order to make them meaningful, Heidegger makes time the very precondition for the existence of the experiencing subject himself.

As distinguished from Kant’s transcendental time, Heidegger’s ‘supertime’ obviously defies integration in a cognitively-logically coherent model of the constitution of time. It is understandable that it is Kant’s view of time that we see reflected in Husserl’s theory of time consciousness. However, since the a priori status of Kant’s time, and, at first glance (see below, however), the apparently absolute status of Husserl’s Presence (Now), indicates ideological motives (see 4.6.8), these concepts would at any moment run the risk of being dissolved by new possibilities of a more complete derivation.

Therefore, especially in view of recent temporal research, philosophy should ask itself whether the evidence of time’s subjective-perspectival nature should not motivate a change of focus toward the perception (and cognition) of space, and the spatial perspective, as the very origin of time cognition, viz., in a coherent hierarchical-processual relationship. Time, in essence, is a function of motion, and motion a function of space. More general-
ly, we are now in a position to conclude that it would apparently have been more favourable for the issue of time had philosophy from its very beginnings directed its attention not primarily toward the relationship between time and Being, but between time and *Becoming*, or, in other words, not between time and state, but between time and *change* of state – and underlying motion. For further evidence of this purport, see Baumer (1977) and above, 4.6.8.

This criticism pertains to all temporal research that chooses metaphysics as its basis, i.e., also to Husserl, but to a still higher degree to Heidegger. To be sure, the latter’s hierarchical differentiation of Being represents a more radical retreat than Husserl’s from the absolute, original status of the Now. However, the consequence is the same: both Husserl’s relativization of the temporality of Presence (cf. Birnbaum 1998) and Heidegger’s foundational view of time imply in reality the undermining of the metaphysical tradition. It is in this very condition that Derrida (1973) saw the justification not only for his ‘deconstruction’ of this tradition but also for his overhasty rejection of phenomenology altogether.

Aristotle questioned the existence of time, arguing that what has been, and what is not yet, cannot be said to exist. He also excluded existence in the Now, which lacks extension and thus cannot be measured (see 4.6.6).

St. Augustine wanted to preserve time by locating the existence of past and future things in our memory and our expectations, respectively. This suggestion did not explain the lack of extension in the Now but was a first step toward the view of time we find in Kant and Husserl, as well as in subsequent, more developed cognitive-pragmatic models treating time as a result of cognitive actions.

Husserl intended to reach the foundation of all knowledge by way of his ‘phenomenological reduction’, i.e., by consciously disregarding our customary conceptions of reality and, instead, in Kant’s spirit, paying attention to how the Subject, in a hierarchically ordered process, goes about the task of objectifying and giving sense to his perceptions. Thereby he, tendentially, abandons Plato’s metaphysical idealism and establishes, actually, the preconditions for a fertile cognitive realism. At the same time he includes in his understanding of our sensory experiences the amount of rationality that is necessary to explain the interplay of individual and collective knowledge. This strikingly modern methodological framework still contains suggestions that are insufficiently elaborated or – over time – may, naturally, represent contradictory solutions. One of the main problems has been Husserl’s idea of the ‘transcendental’ Subject as last resort, isolated from the surrounding world and other Subjects (see 1.10).

The importance of Birnbaum’s contribution is that it offers, by virtue of a careful synthesis of Husserl’s observations of the relation to the Other, a more dynamic interpretation of this relation which, as a result, balances the predominating criticism in the past of both the ‘transcendental’ Subject and
the allegedly absolute temporality of Presence. This alternative interpretation has qualities that undoubtedly also point ahead to a broader perspective for epistemological studies. Accordingly, it can in a constructive way be related to research outside phenomenology, like the study of language as a system of signs, i.e., linguistic semiotics, and the corresponding perceptual-cognitive orientation of linguistic semantics within a biologically founded pragmatic framework, and, more specifically, to current studies of time. Husserl’s application of Kant’s a priori conception to the (absolute) Ego should thus, according to Birnbaum, rather be understood methodologically, viz., as a way of isolating it – just to lay bare the Ego’s relation to the Other.

This proposal appears to grasp the deeper sense of the tendency we can observe in Husserl’s ‘opening’ of the absolute Ego to a temporal differentiation. According to a widespread interpretation, the empathic relation to the Other as oneself in Husserl is preceded by the relation to oneself as an Other, i.e., outside one’s own Now, as when we remember ourselves in the past. In the same way that we can, with the aid of memory, transport ourselves into the past, we can, according to Husserl, also transport ourselves with the aid of empathy into another person’s situation. In both cases we transcend self-presence and recreate an original – one’s own or the Other’s – Now, i.e., as the perspectival point of departure.

However striking this parallel may appear, at closer scrutiny it limps. It overlooks, in my view, the fact that empathy must also be preceded by the temporalization of our own knowledge of the Other, and actually applies also to the relation to oneself as an Other. The question which empathy comes first – the one with oneself or with the Other – is as erroneous as the question whether it is the Ego or the Other that comes first. In the same way that the two can only exist together, they can only arise if they mutually condition each other.

Along these lines, the implications of Birnbaum’s methodological interpretation become increasingly persuasive. Since we do not live in a social vacuum, we cannot recreate in memory our own Now without relating it to the Other’s Now. The Ego is nothing we ‘abandon’ or do not for the Other. The two are rather to be likened to a communicating vessel. The communication takes place via various ‘open’ systems of signs in the shape of actions, including linguistic actions, by which we at the same time interpret and live reality. The motive force of this pronounced interaction is the ‘hidden’ system of signs constituted by our perceptual-cognitive actions in a feedback process governed by abduction (see 3.2). It is here that the temporal perspectivization of reality has its foundation. Its essence is accessible only by way of communication with the Other, in particular the one based on linguistic signs.

Phenomenology should at last be able to break with metaphysics. One of the decisive preconditions for this is, according to the present interpretation, that the perspectival understanding of the Now, when ‘opened’, be extended
to encompass time proper as well. This pertains to the temporal-perspectival differentiation we know as the linguistic tense category, i.e., present, past, and future; but it pertains to a still higher degree to the differentiation of reality based on the fundamental function of time as perspective on motion (interpreted as change or change-relatedness), expressed by the historically neglected linguistic category of aspect. Without attention to this superordinate temporal category, Husserl’s theory of time consciousness (like all traditional philosophy of time) remains incapable of disclosing, beyond the Now, even if ‘opened’ toward the meanings of tense, the function of time as crucial perspectival instrument for the individual’s analysis of change-of-state and cause-effect conditions, pertaining to present situations, as well as past and future ones.

From the very moment that time as perspective on motion can, in a coherent process of cognitive actions, be derived from space and spatial perspective (see 3.16), metaphysics’ postulating time as an absolute, a priori entity is definitively dissolved. This is the ‘constructive’ alternative I propose to Derrida’s thesis that time is a concept that is conditioned by and eliminated along with metaphysics.

I would like to add that the notion of temporal perspective is mentioned once by Husserl (1966 [1893–1917]: 26) but without any connection to the essential functioning of time. It should be emphasized also that Husserl’s stream of time consciousness (referred to here) does not imply that he has fallen prey to the superficial metaphor of ‘moving time’, at least not in the way this has been evidenced above (see, e.g., 4.4). It is true, he speaks (ibid.: 72) of the ”stream of time” (Zeitfluss) and he ascribes (pp. 75, 371) to the Now the role of actually experienced ’point of primary source” (Urquelpunkt); however it would be unfair not to pay attention to his insightful distinction (pp. 73–75, 370–371) between, on the one hand, phenomena of the ‘stream of internal time consciousness’ merely as ”constitutive” (konstitui erend), and, on the other hand, phenomena as ”constituted in time” (in der Zeit konstituirt). It is obvious that this distinction, under the circumstances, can be reconciled with my own distinction between the biorhythmically motivated, non-temporal divisible continuity applied to chaos, on the one hand, and the temporal-perspectival analysis (discontinuation) of this continuity, on the other. To be sure, the Now (the emerging present), in my model, would rather represent temporal analysis, also in the primordial sense indicated by Husserl (see my discussion in 8.4.5–8). It is interesting that Husserl even reveals, in his way, the superficial metaphor at work (also in his own ”stream of time”) when he says: ”This stream is something we name after that which is constituted, but it is nothing tempora lly ’objective’” (p. 371; my emphasis).
Summary

The significance of Birnbaum’s interpretation of Otherness in Husserl’s phenomenology I would, accordingly, see precisely in the circumstance that it emphasizes the perspectival sense of Presence (the Now) and thereby allows of its fertile adoption within the universal perspectivist project as revived in recent temporal research. It also makes it likely that it is in the closer study of the very relation to the Other, i.e., in intersubjectivity (see Ch. 1), that we ought to seek the answers to the question that might be the greatest challenge to philosophy in our time, viz., how to integrate subjective perspective with a theory of knowledge. Empathy – and, one would assume, in a broad sense, its interrelations with physical mimicry (and corresponding mirror neurone activities) – thus stand out as the *sine qua non* for the entire intersubjective process that one would expect to underlie the conventional idea of ’objective knowledge’.
The reality of tense, causality-time interdependence, and the shortcomings of traditional temporal logic

The dilemma of the traditional philosophy of time originates essentially in its almost exclusive attention to the linguistic temporal category of tense and the corresponding view that the latter’s ”status is itself the main and most contentious metaphysical question about time” (Mellor 1981: 1). Unconscious of the linguistic temporal category of aspect and the primarily perspectival nature of temporal distinctions in general, philosophers of time to this day have been obsessed with the questionable idea that the meaning of time, represented by tense, can be described in terms of truth conditions. That this idea of analytical philosophy has little to do with the essence of time – to the extent that the latter can be made accessible to reflective thought – is evidenced by the fact that identical events can be ascribed different temporal perspectives by different observers/speakers in regard to both aspect and tense. Tense perspective, moreover, turns out to be dependent on aspect perspective. Truth conditions in the practice of ’temporal logic’, obviously, have led philosophers of time astray.

One dominant implication of this practice has been the endless and fruitless dispute over the reality of tense. Its point of departure was McTaggart’s (1908; see 4.5) well-known denial of the latter, and of real time altogether, based on his examination of two hypothetical alternatives of temporal distinctions, the A-series (past-present-future) and the B-series (earlier-later), respectively. The subsequent discussion, accordingly, focused mainly on various inconclusive hypotheses, based on one of the two alternatives, about the status of tense in regard to reality and truth conditions. Its main concern was whether tensed sentences reflect a property of existing things and events, ’tensed facts’, or of truth conditions, i.e., ’tensed truth conditions’, applied to ’tenseless facts’. According to one hypothesis, tensed sentences not only reflect ’tenseless facts’ but also have ’tenseless truth conditions’. From the latter standpoint, Mellor (1981: 6) maintained that ”there are inescapable objective truths about what is past, present and future, even though nothing really is past, present or future in itself.” This statement is understandable (if not necessarily acceptable; see below) only if we know that the ’objective truth’ here is considered to be ’tenseless’ in the sense of the earli-
er-later distinction of the B-series as distinguished from the tense distinctions of the A-series.

One of the insurmountable problems that this so-called 'new tenseless theory' (suggested independently also by Andersen and Faye 1980 and Faye 1981; cf. also Faye 1989) has to face is that sentences also may be 'tenseless' in the sense of timelessness (i.e. aspe ctual non-time-relatedness), viz., by expressing, for example, a background perspective like generi city by the exclusive use of present (cf. 'eternal present'), whereas their truth-conditions according to the theory would be 'tenseless' in the non-tense sense of the earlier-later distinction of the B-series (or a corresponding 'date-theory'). Since the latter does not apply in such cases any more than the tense distinctions of the A-series do (see below), we have to question not only the principle of truth-conditions but also the significance for a theory of time of the competing theories of tensed vs. tenseless analysis and their underlying A- vs. B-distinctions. This is in effect the conclusion which also can be drawn from the interchangeability of these competing theories demonstrated by Priest (1986) and interpreted realistically by Dorato (1995: 7) to show that "the debate [between the A-theory and the B-theory] seems to end in a stalemate, since tensed sentences can be given both tensed and tenseless truth conditions, respectively by relying on a tensed and tenseless theory of truth."

Notably, a perspectival conception of time would further modify Mellor's "inescapable objective truth" when it comes to a choice of tense in situations interpreted from different views on change and cause-effect. In a relational theory of time, substantiated further by its perspectival functions, time is understood to be an instrument applied by individual observers to events in order for them to make sense in specific situations. In this respect one may say that (potential) events in the chaos of immediate perception (or subjected merely to subsequent preperspectival continuity; cf. Thelin 1998, 1999; see 3.3, 3.8–9) are 'tenseless', or rather 'timeless', but does this justify a conclusion that tense, or time, is not real in the way events are assumed to be? We cannot probably exclude the possibility that events, like time, are just interpretations-by-construction of the world that we need in order to make it manageable. Apparently, reality and truth in a theory of knowledge, compatible with perspectivism, have to be addressed in quite new ways (cf. Thelin 1999).

It is to McTaggart’s (1908) credit that he carried the classical issue of time’s reality/unreality to its extreme. His denial of time’s reality was consequent on his premises. It has not been well understood, however, that the impasse in temporal studies manifested subsequently by contradictory interpretations in the shape of 'A-theories' and 'B-theories', respectively, had its origin in the non-discernment of the erroneous nature of these premises, not in McTaggart’s conclusions. This would hold for Prior (1967; for a criticism, see Thelin 1999; see also 4.5) and in part for Mellor. McTaggart’s first error
was to disqualify the B-series as being derivable from (replaceable by) the A-series. His second error was to apply the idea of 'moving time' ('passage of time') as an inherent feature to tense (cf. Thelin 1999: 256ff.). The latter is responsible for those contradictions which force him to deny the reality of the remaining A-series, i.e., tense distinctions – and time altogether, including the 'passage of time'. That the idea of 'moving tense' was the main reason also for the subsequent irresolution in time theory was indicated by Dorato's (1995: 5) suggestion based, in turn, on Priest (1986) that "the debate over the truth conditions of tensed sentences reduces to the question whether the truth of a token of [a tensed sentence] is something that can change over time or not."

Now, if the A-series is freed from 'moving time' (treated by a perspectival-relational theory of time as a metaphor of subordinate hierarchy; see 3.16), an immobile distinction is left, identical with the B-series except for its application to the moment of observation/speech. In other words, the tense distinctions of the A-series may, contrarily, be derived from the *earlier-later* distinction of the B-series, as the primary one, by way of expansion. This understanding is more in harmony with the fundamental role in the concept of time ascribed by Aristotle (*Physics* 217–223) to the corresponding 'before-after' distinction (used by me above) and reflected, for example, by von Wright's (1969) logical treatment of change-of-state conditions. It has further been expressed by an earlier suggestion (cf. Thelin 1978a) to handle the semantics of both *tense* and *taxis* by one single opposition 'Anteriority-Posteriority' operating primarily on the moment of speech (as tense), secondarily on established tenses (as taxis), as ANTERIORITY does in the new theory of the *perfect* (cf. Thelin 1991a; see Ch. 9).

From a cognitive-genetic point of view, it would appear reasonable to assume that the 'pure' order of events in terms of *earlier-later* precedes its application to the moment of observation/speech. Such an understanding conforms to intuitive cause-effect analysis and primitive stimulus-response behaviour. It can further be correlated with the (potential) direction of events evidenced by increasing order (negentropy), as suggested by Prigogine (1997: 26ff.), rather than by increasing disorder (entropy) as assumed in accordance with traditional thermodynamics. After all, it is the former example of nature man follows when himself creating order where none can be discerned. If one recognizes man's role as both observer and part of nature, one would even expect him in definite ways to partake of this 'self-organisation'.

Having this in mind, we may consider the ordering of events by way of the pure *earlier-later* distinction (and the corresponding aspectual means of partitioning chaos when rendered continuous; cf. Thelin 1998; see 3.9) as prior to its application to the moment of speech, i.e., in establishing tenses. This cognitive-genetic hypothesis should be reflected by a corresponding hierarchy in the synchronic model of temporality.
The original *earlier-later* distinction may be assumed to appear in this model as an integrated part of the hierarchically superordinate change-of-state and cause-effect analysis in cooperation with aspectual perspectivization. In agreement with this analysis, the latter serves primarily to localize events in a situation, i.e., as belonging either to its state-changing *foreground* or to one of its two kinds of background, the *close background* or the *remote background* (for an account of the development of these notions, see Thelin 1990a: 26ff., 60ff.; cf. also 1999; see 3.12–13, 4.2). However, this aspectual perspective on situations, which indicates its origin in spatial perspective, is possible only by its coordination with the aspectual perspective on event structure. The latter serves (except for cases of remote background and, generally, stative situations) either to delimit events by the total aspect (+TOTALITY) as a precondition for their being ordered, i.e., included ‘earlier’ or ‘later’ in the chain of state-changing foreground events; or, to discern by the partial aspect (–TOTALITY) phases of events as belonging mainly to the close background of, i.e., as being simultaneous with, foreground events.

After the rise of tense the *earlier-later* distinction, apparently by way of reprojection, may be assumed to have received a specialized complementary task, viz., to specify tenses further in regard to what would develop into the distinct temporal category of *taxis*. In this development we are likely to find the explanation for the traditionally enigmatic status of the *perfect system*. As shown above, the latter (pluperfect, present perfect, future perfect), accordingly, is represented by hierarchically complex tense-taxis structures where the taxis feature of ANTERIORITY operates on superordinate past, present or future states, respectively (cf. Thelin 1991a; see Ch. 9). Accordingly, it appears motivated to postulate today – besides aspect – two further distinct temporal categories, viz., *tense* (involving of necessity the moment of speech as primary point of departure) and *taxis* operating on the former. Tense-taxis structures, e.g., in the perfect system, are in turn subject to aspect distinctions. Since the superordinate events, differentiated by tense, are represented here by states (expressed in English by the auxiliary *have*) which do not possess phases, there is no structure at hand to be operated upon by the aspect distinction +TOTALITY/–TOTALITY. The subordinate events, differentiated by taxis (in the perfect system represented by ANTERIORITY), are also subject, however, to aspectual differentiation when they represent phasal events, i.e., activities (cf. *to have read / to have been reading*, etc.).

To hold, as does Mellor (1981: 5), that McTaggart proved tense, but not time, to be unreal would on the above interpretation imply that the A-series is unreal but not the B-series from which it is derived. In other words, real time would be represented by the *earlier-later* distinction alone together with the corresponding properties of ‘objectively existing’ things and events. These consequences are irreconcilable with a relational and perspectival
theory of time. They imply the absolute assignment of direction (and, implicitly, motion) not only to events (which would be justified by a given natural order of events) but also to time itself. This confusion of events and the temporal perspective on events leads to a covert circularity of argument symbolized by the amalgamated notion of ‘temporal becoming’ encountered, for example, in Gale (1968b), Dorato (1995) and Faye (MS). An equivalent critical conclusion was also drawn by Davies (1974: 3) from the standpoint of physical theory.

Temporal order between events (according to the B-series) cannot be more real than the temporal order of events in relation to the speech event (according to the A-series freed of its mobility). Both are the result of individual perspective: in the first case carried out by aspectual distinctions, in the second case by tense distinctions, possibly specified further by taxis distinctions, both, in turn, being dependent on superordinate aspect. Perspectivism can dispense with the A- and B-series. It ascribes to time an equivalent reality, not of objective existence but of cognitive and intentional-pragmatic essence, irrespective of the kind of temporal perspective. Accordingly, it does not make sense to speculate (as a consequence of truth conditions) about the reality of the different tenses, for example, the future (cf. Fitzgerald 1968). From a cognitive-pragmatic point of view all three tenses are equally real to observers/speakers, viz., as interpretations-by-construction of the world derived from their individual perspective and experience. The truly perspectival nature (and spatially-perspectival origin) of the concept of time is instantiated by the circumstance that it may have come into existence on the basis of observations, primarily not of earth’s objective revolution round its own axis but of the apparent motion of the sun resulting from the former.

A perspectival way out of the impasse caused by the recourse to truth conditions and the one-sided focus on the status of tense, determined by McTaggart’s proposals, can actually, at least in its embryo, be traced to a certain vacillation already inherent in descriptions in this tradition. Mellor (1981: 5), for example, actually, maintains that his accepting the unreality of tense does not amount to saying that tense is subjective; however, he refers also (p. 6) to what he understands as indispensable ”states of tensed belief [my emphasis]” expressed by tensed statements (“we need […] to act on beliefs true only at some times and not at others”). The proper significance of this ”belief” – and the consequent role of compelling subject-dependence – remains unclear, though, since it is not integrated systematically in Mellor’s ’token-reflexive’ account of tense. The very essence of ’token-reflexivity’, however, in local (cf. ’here’) as well as temporal (cf. ’now’) indexicals, is the subject-dependence of their assignment to things and events by speakers/observers according to their individual point of observation – in a broad sense, i.e., including local, temporal, and experiential perspectives. In the light of an explication of observers and their points of ob-
servation for the deduction of temporal distinctions, the rather inductive concept of ‘token-reflexivity’ obviously can be dispensed with as well.

The conception of “temporal belief” was also appealed to by Faye (1989; MS) – in a promising direction of subjective perspective – in order to account for the divergent fact that tensed and tenseless statements, both with tenseless truth conditions and, accordingly, equivalent underlying (tenseless)”facts about the world”, have different meanings, i.e., cannot be replaced by each other. Like Mellor, Faye still resorts to an ad hoc inclusion of factors constituting, in reality, the heart of the matter, viz., ”different epistemic attitudes towards the world” (MS: 3). Unfortunately, he does so on the premise of ascribing tensed sentences and tenseless sentences to one and the same level of analysis. Accordingly, ”the two kinds of temporal beliefs” (Faye 1989: 15), without further explication, are said to be ”reflected by the fact that tokens of a tensed sentence have variable truth values depending on the time of utterance, whereas tokens of a tenseless sentence are invariably true or false independently of the time of utterance.” What Faye is suggesting here, and would see supported by Kaplan (1978) and Perry (1977; 1979), is nothing more nor less than the B-theorist’s (’date-theorist’s’) invocation – on the level of truth conditions – of A-theory mobility (in the shape of variable truth values) to match B-theory immobility (in the shape of invariable truth values). Under these circumstances the B-theory cannot free itself of the circularity of argument caused by the confusion of motion of events with time (cf. ’temporal becoming’). Tense, and time, theory indeed reduces, as recognized by Dorato (1995: 5) to ”the question whether the truth of a token of [a tensed sentence] is something that can change over time or not.”

What we are facing is thus a situation where the contradictions of truth-conditional treatments of time (tense) point to the need not for complementary amendments but for a complete revision of the traditional theoretical framework. This can be illustrated by the way truth conditions have led to an analysis of tense that is no longer reconcilable with linguistic facts:

First, B-theorists fail to prove their tenseless hypothesis by translating tensed sentences into tenseless ones. Saying

\[(7.1)\] It is raining now.

is not the same as saying

\[(7.2)\] It is 9 o’clock Monday morning and it is raining.

although both sentences may refer to the same situation. However, while ‘dated’, (7.2) is still tensed. In order to prove then that tensed sentences like (7.1) refer to underlying tenseless facts, B-theorists must show them to have the same (tenseless) truth conditions as tenseless, ‘dated’, sentences allegedly have. For this purpose they adduce sentences like
(7.3) It rains at 9 o’clock Monday morning.

and maintain that the token of (7.3) is true if and only if it rains at t, and the
token of (7.1) is true if and only if uttered at t.

However, this analysis does not prove that facts are tenseless, i.e., possess
an inherent temporal structure in terms of earlier-later according to the B-
theory. It can rather be shown to demonstrate that underlying ‘facts’ are
timeless. It thus cannot have escaped the reader’s attention that a sentence
like (7.3) – as it stands – differs from (7.2), and in view of normal language
usage represents a construction of disputable status. By the present simple
form rains, a tenseless reading (according to the earlier-later distinction) is
suggested. Language usage, however, indicates here the properly tenseless,
i.e., generally timeless (non-time-related), reading that we know precisely
from truth conditions, although (7.3) is adduced as a normal sentence com-
parable to (7.1). Such a comparison, consequently, does not work because
timeless sentences, e.g., generic ones, cannot be tenseless (in the sense of
displaying the earlier-later distinction of the B-theory) any more than they
can be tensed. As a consequence of their superordinate aspect of remote
background they admit neither kind of distinction; cf., e.g.:

(7.4) The earth revolves round its own axis.

This does not imply that events in generic sentences cannot be ordered; cf.:

(7.5) Pride goes before destruction.

but such examples do not display temporal order in the actual sense of the
earlier-later distinction of the B-series, dating singular events. Rather they
display more or less evident patterns of causal order derived by abstraction
from the frequent experience of singular instances of temporal order (i.e.,
given that causality is observable at all; cf. Examples 7.7 and 7.8 below).
This interpretation gives general support to Mellor’s fundamental focus on
the interrelations of cause-effect and time. However, when he says (1981: 8)
that “causal order fixes temporal order” (cf. also Faye 1989, 16: ”causal or-
der is the only criterion for a temporal direction”), this, on the present inter-
pretation, would pertain only in a secondary and restricted sense, viz., in
terms of a speaker’s/observer’s working hypothesis or strategy developed
experimentally by way of procedural feedback and, thus, predicting (”fixing”)
temporal order from primarily perceived causal order. This would explain
the well-known fact that observers sometimes may perceive the temporal
order of events differently according to their interpretation of their cause-
effect relations. However, in new cases of (potential) cause-effect relations
which continue to present themselves all the time, we have to assume inter-
pretation normally to begin in experiences of singular temporal appearances.
Prediction of temporal order from causal order, according to the above analysis, cannot therefore be absolute or understood to imply (as maintained by Mellor in a seminar discussion) that there can be no temporal order without causal order. The latter view would belong in a radically 'causal' theory of time. One should – according to the interpretation above – not maintain the opposite either, i.e., that there can be no causal order without temporal order. First, cause founded on the remote background is not related to effect by any obvious temporal order. Second, such a view does not make any real sense if we assume the mutual dependence of the two, founded on the primitive, temporally indeterminate distinction stimulus-response ('if-then'), conveyed, actually, more properly by notions closer to the original spatial ones like 'before-after' or 'first-next' than by *earlier-later* (see 2.1, 3.9, 3.12). One might, therefore, even maintain that cause-effect is cognitively closer to stimulus-response and its modal notion 'if-then' than temporal *earlier-later*. Even if one understands both notions to be derived from an underlying spatial distinction involved in change, the former condition of closeness could be viewed as the reason for the obvious status of object of observation ascribed to causality – as distinguished from the instrumental status of time – and expressed by its inclusion, together with change, in the primary questions we ask when analyzing the situations: (A) Is there a change? (B) Is there an observable (inferable) cause for the change? (How can I adapt to or counteract the change?) However, questions of temporal conditions are asked by way of implicit cooperation since they are instrumental-perspectival by nature. The latter are thus hierarchically on a par with questions of change-of-state and causality to the extent that causality is subject to observation (inference). Questions of causality are in general dependent on (in the sense of being triggered by) questions of change-of-state (see below, however). The mutual dependence of causal and temporal order has to be differentiated with respect to cognitive-pragmatic conditions, on the one hand, and their accessibility to observation, on the other. One can easily produce utterances where the temporal order of events is determined by the speaker/observer exclusively on the basis of temporal factors (interchangeable in different situations for no obvious reasons); cf.:

(7.6) This morning John read the newspaper before he had a shower. Then he had breakfast.

The possible objection that there 'must have been a reason' for John’s acting precisely in this order, would, of course, be irrelevant (even if it were true) as long as this reason is unknown to the speaker/observer.

In a similar way temporal order (i.e., in the abstracted sense) may appear in generic sentences without an underlying causal order unambiguously evident to the speaker/observer (or merely as possible, but not decisive, object of speculation):
(7.7) After rain comes sunshine.

(7.8) Night gives birth to day.

Causal order, like ‘natural order’, of events, to the extent that they exist, are obviously accessible only by means of (provisory) temporalization in complex interpretations-by-construction (including pattern matching analysis) triggered by change-of-state or, rather, the hypothesis of change-of-state (since the latter, too, can be tested only by means of temporalization; see above, esp. 3.9–10). Although there should indeed be a cognitive hierarchy in so far as cause-effect analysis generally presupposes the establishment of change-of-state, the prominent mechanism of processual feedback, in fact, would also enable the influence of cause-effect experience upon the successive establishment of change-of-state. This is then a parallel to the secondary impact exercised by causal order on temporal order suggested by the above modification of Mellor’s unidirectional hierarchy. There is an evident risk that the latter might lead to ‘bad circularity’ as distinguished from the system-inherent ‘good circularity’ of relative and dynamic hierarchy ensured by processual feedback in perceptual-cognitive operations. The recognition of the latter distinction (not observed by Gale, 1968b: 4ff.) appears to be an important prerequisite for a renewal of temporal theory based on the original conditions of space.

In view of these conditions it appears reasonable to assume that the questionable status of (7.3) is due to the combination of the date with the timeless reading of the sentence suggested by normal language usage (rather than the tenseless reading invoked by the B-theorist). This is not merely a matter of "occasional inelegance" caused "by using the present tenses of verbs atemporally" (Mellor, 1995: 8ff). It is rather a matter of systematic irreconcilability due to the fact that 'atemporality' in reality is a kind of remote background perspective which implies not only tenselessness but general timelessness, incompatible with date. Exceptions to this incompatibility are, for example, conditional clauses, hierarchically embedding dates into superordinate timelessness (remote background) of modality (cf. Thelin 1990a: 66); cf.:

(7.9) If it RAINS (at 9 o’clock) on Monday morning, we will have to cancel our tennis match.

However, as indicated by the brackets, such a tenseless reading of simple forms might, according to my informants, be overruled by the precise indication of time ‘at 9 o’clock’, suggesting rather the time-related, total aspectual meaning of (future) foreground change in the form of inchoation (‘starts raining’; compare Example 7.12 below).
In cases of close background (cf. Examples 7.10 and 7.11), foreground embedding (cf. Ex. 7.2), and foreground (cf. Ex. 7.12) – aspectual distinctions not accounted for by the B-theory – indications of date most naturally combine with unambiguous indications of tense:

(7.10) If it IS RAINING at 9 o’clock Monday morning, we will have to cancel our tennis match.

(7.11) At 9 o’clock Monday morning it WAS RAINING.

(7.12) At 9 o’clock Monday morning it STARTED RAINING.

This would not necessarily follow from the cognitive hierarchy suggested by the B-theorist’s strict demarcation between allegedly objective points of temporal reference, on the one hand, and subjective ‘tensed beliefs’, on the other, especially if we take into consideration the relations of dependence between the two: if indications of tense for aspectual reasons are excluded, then indications of singular dates, as we have seen (cf. Ex. 7.4), are, as well. Tense indications, however, are possible without indications of date, but not, as illustrated by Example 7.3, the other way round. This would indicate the hierarchical superiority of tense relative to dating. Rather the contrary was suggested by the B-theory and its hardly well-founded assumption that singular dating can occur without tense indications. If indication of tense is excluded, however, then it is so by force of superordinate, aspectual, timelessness. These conditions cannot be explained by a theory of time based on truth conditions and the exclusive category of tense but only by a perspectival theory of time based on a system of hierarchically dependent distinctions of the temporal categories aspect and tense, as well as taxis. The original ‘before-after’ distinction, which may be assumed to have given birth to taxis, in a corresponding functional model is understood to survive in a basic function, viz., as an integrated part of the change-of-state and cause-effect analysis in intimate cooperation with temporal perspectivization. Although also apparently derived from the original ‘before-after’ distinction, functions of measurement (of duration) and localization (‘dating’) should in a synchronic grammar of time be assigned a subordinate role in comparison to the perspectival functions of the three temporal categories proper (see 3.16, 8.3–4).

Summary

The truth-conditional practice of traditional temporal logic (‘tense logic’), based on McTaggart’s denial of the reality of tense (and subsequent interpretations of it; see 4.5), is shown to end up in an inconclusive debate between
A-theory and B-theory. The obvious contradictions inherent in such treat-
ments of cognitive-linguistic data point to the need for a complete revision
of time theory. By founding the latter on a perspectival understanding of
temporal distinctions we are in a position to advance the aspect category as
the basic temporal (spatial/temporal) component. Without it our understand-
ing of ‘temporal logic’ – in a more essential and comprehensive sense, in-
cluding the category of tense, as well as the category of taxis – would indeed
remain not only incomplete and incoherent but also contradictory.
8 Prerequisites for a theory of aspect and tense in narration

8.1 Time, eternity, and the definite-indefinite distinction

The theoretical issue of temporal structure in a broad sense has a long tradition in the study of language and literature. In his *Poetics* (Ch. 20: 1457a) Aristotle ascribed to the verb the function of 'temporal determination' which is missing in the noun, viz., by indicating present, future or past time. The German term *Zeitwort*, denoting the grammatical category of verbs, reflects, of course, the same old insight.

Treatments of the concept of time in ancient philosophy (for a more comprehensive presentation, see 4.6) likewise convey observations of relevance to understanding the meaning of time as an essential linguistic and poetic-linguistic problem. By excluding past and future from the meaning of *eternity* (though not yet speaking of 'eternal present'), Plato (*Timaeus*: 37c; quoted after Ricoeur 1983: 46), for example, in a sense established a first approximation of the distinction so crucial to modern aspectology, viz., the one between time-relatedness and non-time-relatedness of reported events (cf. Thelin 1978a: 30–31, 65–66; 1984a; 1985: 173ff.; 1990a, b; see above, for example, 5.5). For the latter’s interrelations with the distinction unity vs. manifold, see 4.6.2, 4.6.8.

The subsequent theological discussion of *eternity* and *time* as two different forms of existence, i.e., the life of God, the Creator, and of man, the creature, respectively, develops further the Platonic distinction by paying more attention to the psychic activities of man involved in the perception and cognition of time. Consequently, according to Gregory of Nyssa (quoted here in the interpretation suggested by Callahan 1960: 61),

[T]he nature that is self-sufficient, eternal, and all-embracing is not in place or in time, but is before and above these. This nature is not measured by ages, nor does it run along with time, but it is firmly fixed in itself and is not divided into past and future. For past and future are affections proper to created beings, and refer to the memory and anticipation of the life that is divided by time.
Callahan's merit is to have pointed out that the position taken by Gregory of Nyssa mediates between the Neo-Platonist conception of time as a divine principle of soul (Plotinus) and the psychological understanding developed by St. Augustine in his well-known discussion of time as an important complement to the traditional metaphysical view.

The cognitive-linguistic relevance of the religious distinction between time and non-time as an expression of the two kinds of being represented by man and God, respectively, is evidenced, for example, by the Sanskrit perfect in the hymns of the Vedas. As shown by Renou (1925), the Vedic perfect, though situating events in the past, was reserved for the Gods, in particular for principal parts of the narration to mark their general and solemn character. The same author, correspondingly, points to the special treatment given the desinences of the perfect in Panini, relating them to nominal suffixes.

Kristeva (1969: 273ff.) has shown the universal significance of such historical facts by bringing them into logical connection with the non-time-related use of the imparfait in French and thus giving support to the idea that the organization of temporal perspective in narration is based on an aspectual distinction, namely the one between time-relatedness and non-time-relatedness or the corresponding spatial/temporal distinction between foreground and background, respectively (cf. Thelin 1984b: 226ff.; 1984a: 264ff.; 1985: 180; 1990a, 1990b). In the light of the presumably primordial nature of the latter distinction, and in particular the possibility of its consistent further differentiation, suggested above, viz., between close and remote background, let us accept here the former distinction merely as a simplifying abstraction of the primordial spatial-temporal conditions and a convenient instrument for the preliminary analysis of situational structure (and the development of a corresponding theoretical model). For a discussion of the possible interchangeability of the foreground-background distinction, including its further differentiation, and the distinctions based on conditions of change-of-state and change-of-state-relatedness, see 5.6.

As we shall see, there exist, in fact, different degrees of abstraction subsumed under the general notion of non-time-relatedness, but Kristeva (1969: 275) is perfectly right in stating that her hors-temps or fautemps, marked by the imparfait,

n’est pas un temps narratif. Il ne raconte aucune histoire ni se réfère à aucun fait représentable, même si « le recit » semble mimer des faits […] Si tout temps est un temps de récit, le fautemps n’est pas un temps: il abandonne le récit et ses modalités au présent, à l’œrister, au futur […] Sans préciser le temps et le lieu d’action, cet imparfait du « je » hors-jeu, hors-temps, fautemps, le désigne comme non localisable et non temporel.
In this light it becomes evident that linguistic theories of aspect and tense have paid relatively little attention to the development of the concept of time itself, proceeding usually from the tacit assumption that its basic meaning is more or less self-evident. The true temporal essence of aspect, for example, has thus been obscured as a rule by the strong influence of superficial morphological oppositions and by its confusion with verb semantics (e.g., in the spirit of the Aristotle-Ryle-Kenny-Vendlerian tradition, accepted in most Anglo-Saxon aspectology; cf. Thelin 1985: 173; 1990a: 6ff.) or related semantico-syntactic conditions (as in the case of the so-called ’terminativity theory’, persisting in most Russian aspectology; cf. Thelin 1984c: 227).

In reality, explorations of the historical origin of the aspect category (cf. Thelin 1978a: 1ff.) indicate that the distinction implicit in the possibility of relating events concretely to time, or, conversely, abstracting or even completely removing them from it (in the former case tense distinctions are still possible, in the latter – usually not; cf. Thelin 1984a: 227; see 3.12, 4.8) is of a fundamental cognitive-semantic nature and can be traced back to the very process involved in the development of aspect. The latter is assumed to imply (apparently, also under a certain influence of the growing tense distinctions; cf. Paul 1979: 274ff.; see 8.4.5, 8.4.7) the change of an original more general definite vs. indefinite character of the verb (corresponding to the one with nouns; cf. Thelin 1978a: 1ff., 19; see 8.4.6) to a specific definiteness vs. indefiniteness applied to time. Time as perspective emerges according to the present assumptions as an abstraction from events, based on time’s derivation from the underlying perceptual-cognitive structures of space and motion; see 3.16, 8.4).

These assumptions harmonize with Rundgren’s (1959: 89, 91, 307) idea of ’pure’ vs. ’localized’ or ’temporalized’ aspect in his analysis of the conditions in Semitic, with Koschmieder’s (1929; 1934: 13ff., 228ff.) definition of aspect as an expression of ”Verzeitlichung der Verbaldetermination” and Menges’ (1968: 128) similar understanding of the aspectual oppositions in Ural-Altaic. Furthermore, conditions of definiteness-indefiniteness with objects (cf. Kramsky 1972) have been shown by Chvany (1983: 75ff.) to be generalizable and applicable also to processes and situations. She thus demonstrates the relevance of their specification as to time and space (in terms of ‘Saliency/Non-Saliency’) for their relation to such basic narrative oppositions as background-foreground and theme-rheme.

The ancient recognition of man’s ability to concretize or abstract ’reality’ in relation to time has not, however, with rare exceptions, been reflected in a more systematic way in modern theories of aspect and tense. The suggestion (supported by certain evidence from Indo-European as well as non-Indo-European languages) to consider the opposition time-relatedness vs. non-time-relatedness (and related distinctions) as the cognitive-semantic basis of the universal system of temporality, actually, conditioned the first attempt at a consistent hierarchical-componential analysis of aspect capable of bridging
this very gap in the tradition of temporal studies (cf. Thelin 1978a; 1985: 173ff.).

There certainly have been, in the past, various non-systematic observations of the non-time-related use of Slavic imperfective aspect forms with the so-called ‘generalized-factual’ meaning as distinguished from the invariant ‘concrete-factual’ meaning of perfective aspect forms (cf. Rassudova 1968). Bondarko’s (1967; 1971: 10ff., 31ff.) feature ‘+/– localization in time’ and Maslov’s (1973: 82) explicitly universal understanding of the distinction discussed were important, but mostly overlooked, steps on the rough road toward a deeper understanding of the cognitive essence of aspect semantics. However, Bondarko’s distinction occupied a rather subordinate status in his system of oppositions and could not be brought into a hierarchical-logical relationship either with a likely diachronic process of aspect development (like the one indicated above) or with the system-inherent distinction +TOTALITY vs. –TOTALITY, which, according to my presentation, further specifies the given kind of time-relatedness (i.e., as a total vs. partial reference to events associated with time; see 3.16, 4.8). Maslov, on the other hand, was unaware of the true temporal quality involved in the distinction ‘generalized-factual’ vs. ‘concrete-factual’. The same condition holds, indeed, for both Forsyth (1970: 5–6) and Comrie (1976: 113). Pettersson’s (1972) suggestion to interpret Bondarko’s opposition as equivalent to his own opposition ‘+/–Activity’ was due to his confusing basic aspect semantics with verb semantics and had the inevitable consequence that his opposition ‘+/–Time’ became inconsistent not only with the facts it was supposed to explain (see the criticism in Thelin 1978a: 57ff.), but also with the basic insights into the mechanisms of man’s perceiving ‘reality’ in relation to time gained within the empirical framework outlined above and broadened below.

Before we are in a position to formulate adequate linguistic or poetic-linguistic models accounting in detail for the functions of aspect and tense in narration, I believe it necessary first to explore more incisively the concept of time proper and its perceptual-cognitive status. This will also be the main concern of the following presentation.

8.2 In the footsteps of St. Augustine

Judging by most modern theories concerning the functions of time in grammar, linguists apparently can still profit from the open-minded attitude and clear path of reasoning demonstrated by St. Augustine (and treated below in its essential parts on the basis of the exposition offered by Ricoeur 1983: 19ff.; quotations refer to chapters (in italics) and sections of Book XI of Confessions).
8.2.1 The physical and psychical ontology of time  
Opposing the famous sceptical argument that "time does not exist" (viz., because "future is not yet, past is no more, and present does not remain"), Augustine questions how something can be measured that does not exist: "Yet, Lord, we perceive the intervals of time; we compare them with each other, and we call some longer, some shorter. We measure further how much one time is shorter than another" (16, 21). But by what means (quo pacto; 15, 18) does one actually measure time? Searching for an answer to this crucial question, Augustine works his way through a long chain of observations and statements. To begin with, he observes that it is only about past and future that we can say that they are long or short. Thus he concludes that present has no extension. He then goes on to modify the absolute understanding of time demonstrated by the sceptical view referred to above (4.6.2), considering time rather as a quality assigned to events reported as existing "future things" and "past things".

"If future things and past things exist", he continues his discussion, "I want to know where they exist" (18, 23). Proceeding from the idea that past and future represent the activities of narration and prevision, respectively, Augustine now takes a decisive step toward the psychological dimension of time by correlating these activities with the functions of memory and expectation, respectively. By assigning to both of them an existence in the mind, he is in a position to corroborate his preliminary assumption that "past things" and "future things" exist, and to situate them in the mind in the form of images. Consequently, on this psychological level he not only solves – in his own way – the ontological dispute about time but also removes, at least at first glance, the previously stated opposition (extension-non-extension) between past and future, on the one hand, and present, on the other: "[M]y childhood, which is no more, is in past time which is no more; but its image […] I retain in present time because it is still in memory" (18, 23).

Formulating thus his 'three-time-theory' (including "present of the past", "present of the present", "present of the future"), Augustine, in fact, gives expression to the idea of the hierarchically superior status of the mental activities underlying ('present' in) all enunciations (irrespective of their reference to past, actual or future conditions), i.e., the permanent psychological present, or, in other words, the moment of speech as the obligatory point of departure for expressing all kinds of temporal order (cf. Thelin 1978a: 37ff., 41ff.). His "(present of the) present" is, consequently, understood as vision or attention, i.e., the psychological presence of actual perception as distinguished from memory and expectation in cases of "(present of the) past" and "(present of the) future", respectively.
8.2.2 Time as measure: mental extension, motion and duration

The careful reader cannot have overlooked the fact that Augustine – in spite of the development of his argumentation toward a psychological dimension of time – at this point is still far from answering the introductory question, by what means can time be measured. Nor have we any explanation for the circumstance that "present" according to the first observation has no extension, whereas his superordinate ‘psychological present’ does appear to have.

Turning directly to the question of measurement Augustine (21–31) states that time is measured "as it passes". But what passes is "present", he continues, and "present" has no extension. Now, since time can be measured, it must still have extension, but extension of what? The solution to the contradiction must then be that extension of time is an extension of mind (distentio animi). This idea of Augustine’s that time and its extension is a function of man’s perceptual-cognitive analysis of ‘reality’ – however true its underlying general assumption may be – appears, so far, to proceed from the same absolute and unrelated use of the concept of time as demonstrated above in the sceptical argument for the non-existence of time. One is thus entitled to ask: is it, after all, time that is measured in the first place, or is it not rather something else that is measured with the aid of time? Could not extension be understood as a feature inherent primarily in this "something else” perceived, cognized, and measured, or, as derived from it by way of abstraction?

Time as measure had already by Aristotle in his Physics (11.219b2, 12.221a1) indeed been related to motion, without being identified with it (see 4.6.6). The concept of extension had an interesting prehistory, too. According to the Stoic view, represented by Chrysippus (cf. Callahan 1960: 63), time was understood more precisely as "an extension (diastema) that accompanies the motion of the universe.” Gregory of Nyssa (ibid.: 60) combined a similar understanding with the concept of measure by referring to time “as an extension accompanying or running along with the universe of becoming and as being, in addition, the measure of all motion in the universe.”

It is ironic that Augustine arrived at his psychological reductionist solution of distentio animi immediately after an incisive discussion precisely of time and motion which he abandoned just a few steps from the discovery of the essence of their interrelationship, prematurely confessing his failure (cf. Ricoeur 1983: 32ff.). In fact, he had argued most convincingly for an understanding of time as related not only to the movements of celestial bodies (because he did not preclude that their velocity could be variable), but to movements of any bodies whatever. Thus liberating the concept of time from its compulsory association with regularly repeated movements, he was, potentially, in a position to give it the generalized status of a flexible cognitive instrument for comparing all kinds of motion, namely in regard to their duration: “The motion of a body is one thing, what helps us measure its duration
is another; who would now not understand which of them deserves to be
called time?” Still Augustine failed to recognize what this “what” is. He had
previously asked the question “whether it is the motion (motus) itself that is
the day, or the duration (mora) within which it is accomplished, or both” (23, 30).
Later he had even stated that in order to distinguish the moment
where the interval of time begins and where it ends, it is necessary to “mark”
(notare) the place from which a moving body departs and where it arrives,
since otherwise we cannot say “in how long a time, from one point to anoth-
er, the movement of the body or its parts has been accomplished” (24, 31).

8.2.3 The remaining discord between Augustine’s ”mental
extension” and cognitive-pragmatic (aspectual) conditions of
time
Ricoeur (1983: 33, 40) has correctly pointed to the difficulty arising from
Augustine’s basically fruitful spatial view, on the one hand, and his situating
time as extension exclusively in the mind (see above, 8.2.2), on the other.
This difficulty, as well as the general vacillation between his psychological
postulate and his observations about ’reality’ (like the one mentioned at the
end of the preceding section), thus causing his irresolution, obviously goes
back to his defective initial argumentation: “[I]f time can be measured, it
must exist; now, time can be measured only in past and future, not in pres-
ent; past and future thus have extension, present not; if we hold that present
is time, too, it must have extension; this extension then exists in the mind for
present as well as past and future.” Consequently, the asymmetry between
extension and measurement on one level is not really solved but rather re-
placed by symmetry on another level, i.e., it cannot be accounted for by any
consequent correlation of psychological time (as generally being extensible
and measurable) and ’real’ time (as being extensible and measurable only in
part).

Ignoring the inability of his abstract psychological model to explain sys-
tematically the (linguistic) use of time, more specifically the reason why
’real’ present indeed cannot be used for extension or measurement (at least
in cases of time-relatedness), Augustine, in fact, retreats unconsciously be-
fore an aspectual obstacle, namely the distinction +/-TOTALITY and the
natural, pragmatically and perceptually based, incompatibility of the cogni-
tive-semantic feature, in reality conditioning measurement by delimitation,
viz., +TOTALITY (the total view of an action reported as related to time),
with the present, i.e., with the moment of speech when coinciding with the
action reported (see 3.12, 4.2, 4.6.6, 4.8). In the latter case only –TOTA-
LITY (i.e., the partial view of an action reported as being related to time) is
possible, that is, the action can be referred to only with respect to that specif-
ic part or phase of it that coincides with the moment of speech. For under-
standable reasons an action reported as going on simultaneously with the moment of speech is not surveyable in its totality and cannot be ‘extended’ or measured either.

This is why the total aspectual meaning of Slavic perfective verb forms in the present is incompatible with the actual present meaning (and transposed to denote future meaning) or why simple forms in English cannot appear in the present in their time-related total aspectual use but only in their various non-time-related uses: 'eternal', gnomic, generic, habitual, etc. The actual present meaning can thus as a rule be expressed only by imperfective and ‘continuous’ forms, respectively, conveying the aspectual meaning of partial reference. The 'historical’, reportative and performative use of English simple forms in the present tense is assumed to be due to a specific mechanism of temporal transposition, representing actual events as total (indeed, an 'aoristic' use) and having them thus immediately vanish into the past as a prerequisite for their sequentialization (cf. Thelin 1982). Simple forms of English verbs, denoting genuine states, can express time-relatedness in the present, but not totality, since states are not analyzable per se in terms of wholes or parts (phases); see 3.13, 8.2.5.

8.2.4 Aspectual delimitation and time as relative measure

Thus unable to convey the crucial interrelations between the perceptual-cognitive and pragmatic constituents of the semantics of time, Augustine’s views are burdened by certain contradictions not explained by his restricted model (furnished in the first place to prove the existence of time, viz., as mental extension), but potentially handled within his general psychological understanding and pertinent observations of temporal functions. That is why he fails to see that generalizing the concept of time from being exclusively a measure of duration based on regular motion to being a measure for all kinds of motion, he introduces instead of the concept of time as absolute measure the more abstract concept of time as relative measure. While not discerning the latter’s mode of functioning, Augustine remains captive to the cosmological idea of some necessary standard measure, but since he does not recognize absolute constancy with physical movements, his generalized concept of time brings him into a seeming dilemma. This difficulty is connected with his inability to realize that the procedure correctly observed by him, viz., that time is distinguished by “marking” the initial and final point of a movement (the duration of which is measured), implies an operation that is of a more fundamental, namely an aspectually delimiting, character (expressed by the feature +TOTALITY referred to above), and can take place without a subsequent comparison between different delimited movements (actions) in regard to their duration.

It is important to state that aspectual delimitation is a relational mechanism conditioning the perception and cognition of temporal order between
movements (actions) as well as their preceding/resulting states (see 8.4.4), and as such offers a natural point of departure for a comparison with respect to their *relative temporal extension*, as well. If regularly repeated physical movements did play a decisive role in the development of the concept of time (and on this point there seems to be general agreement), then it cannot have been in the sense of an absolute standard (as it would have been in Augustine’s mind) because the development and refinements of instruments for measuring such constancy have continued to the present day, but precisely in the sense of *relative extensions ‘in time’*. The fundamental relational mechanism is evidenced, as a matter of fact, by the scale of linguistic expressions for time units according to the corresponding *relative range* of temporal extensions (day, week, month, year). Implicitly Augustine gives support to this relative understanding of time by assuming, hypothetically, changes in the velocity of movements serving as temporal standards (23, 30). He even maintains that motion may stop, but time may not, and asks whether we do not, in fact, measure stops as well as movements (24, 31; see 8.2.5).

8.2.5 Time as duration of motion between states and the aspectual distinction +/–TOTALITY

Unable to incorporate his keen observations of ‘reality’ within his reductionist model of *distentio animi*, Augustine never arrives at an integrated, consistent theory of time. With critical distance and accumulated knowledge it is our privilege to approach the problem of time as treated by him and to explore where he went wrong. Relevant factors involved in the concept of time seem to be there (motion, extension, points, delimitation, velocity, constancy/variability, duration, measure, comparison), but their mutual hierarchical-processual dependency remains unclear in the shadow of Augustine’s thesis of the three times and its idea of mental extension as an isolated analytic instrument. Therefore, they cannot constitute any systematic device for deriving (explaining) the meaning of time.

*Quid est enim tempus?* Now, by using and organizing merely the factors already present in Augustine's discussion we could, indeed, formulate at least a provisional definition of time that might serve as a feasible point of departure for the subsequent more comprehensive analysis: *time may be understood as a measure of the variable extension, i.e., duration, of a movement between two points according to its velocity* (see 8.4.1). It should be noted that velocity in the model developed here is ascribed a subordinate role in comparison to the role it plays in, for example, Piaget’s theory of time’s emergence in the child (Piaget 1946; 1969: 107–109).

Related to extensions in a world in motion, ‘points’ could be understood here as *states* (old and new states, i.e., states preceding movements and states resulting from them, respectively). The concept of state may further be
related to perceptual as well as pragmatic conditions. The concept of *pragmatic state*, e.g., the intended result achieved by a movement (action), should, I suggest, be distinguished from the concept of *perceptual state*. A pragmatic state is always also a perceptual state but not the other way around. The fact that we can thus also judge the velocity of a movement *between* two (pragmatic) states is conditioned by the perceptual strategy of segmentizing motion into *intermediate* (perceptual) *states* or *phases* (cf. Bergson 1911b: 18, 32, 171–172, 288, 317–318, 323; Johansson 1950, 1964; Miller & Johnson-Laird 1976: 83ff., Newtson et al. 1978; Thelin 1984b: 231; 1985: 163ff.; see 3.11, 5.7). This important condition, as indicated above (8.2.3; see also 8.4.4, 8.4.7–9, 8.5), has direct bearing upon the aspectual opposition +/-TOTALITY and gives empirical support to an equipollent interpretation of the feature –TOTALITY, underlying the meaning of ongoing process, viz., as partiality, or, in other words, reference to one part or phase of the movement (action) reported as related to time (cf. Thelin 1978a: 31ff., 110ff.; 1980: 432ff.; see 3.8–9, 3.12–13, 4.3, 4.8, 5.5–7, Ch. 7). I have pointed to the interesting fact that the use of the *partitive* case with objects in Finnish may convey exactly the same processual meaning of the verbal action as expressed by English ’continuous’ forms or Slavic imperfective forms in their time-related use.

True (pragmatic) states do not, however, possess any internal structure that can be segmentized or partitioned since they are not assigned divisibility (phasality) by biological rhythmization. Hence the simple explanation as to why true stative verbs in English do not as a rule take ‘continuous’ forms (for a discussion, see Thelin 1991b: 283), viz., because the latter express ongoing process precisely by means of partial reference (–TOTALITY). States can be measured, however (Augustine’s observation with respect to ”stops” is correct), but only in terms of surrounding movements, i.e., as the extension between the final point of the preceding movement and the initial point of the subsequent one. In a corresponding way states (lacking extension and phases of their own which would allow for their direct association with time) can be related indirectly to time when reported as being defined by surrounding time-related movements (events) or as potentially changeable by such (future) movements.

8.3 The perceptual-cognitive hierarchy of matter, space, and time: localist prerequisites for a theory of aspect and tense

Proceeding from the view that linguistic theory must somehow account for the fact that the semantic complex of time and its various linguistic shapes and poetic uses cannot be understood in a deeper integrative way without our
paying attention to how time is perceived and cognized in a context of action (interaction) and linguistic reproduction of action, I would now like to suggest a rather concrete localist approach to this concept and the preconditions for its development. The diachrony of time (construction) is understood here in the sense of perceptual-cognitive ontogeny, based on general, phylogenetically given, human capacities for the perception and cognition of matter, space, and motion. This diachronic development is mirrored by the diachrony of socio-culturally conveyed patterns of action and interaction, including linguistic interaction (and, thus, linguistic structure), serving, in turn, as activators of phylogenetic dispositions and, simultaneously, as devices for the direction of ontogenetic processes. The synchrony of time (construction) pertains to a definite stage of its ontogenetic development (for example, in the growing child) or, contrarily, of its decline due to diseases or aging.

The idea of deriving temporal meanings from spatial ones is not new of course (see the discussion in 2.2), and appears to be justified by, among other things, the fundamental perspectival function they have in common, and the higher degree of abstraction represented by the former.

Furthermore it is well-known that temporal meanings in the form of aspectual features in many languages are (or have been) conveyed by local (prepositional or adverbial) expressions (cf. Middle English he waes on hun-tunge, German er war am Jagen; further dabei sein etwas zu tun, French être en train de faire quelque chose, English to be in process, motion, at work, etc.). Tense meanings are often expressed by verbs of locomotion and so on. The general direction of evolution from the concrete concepts of space and motion to the more abstract concept of time (see 3.16) could thus at least symbolically be rendered, for example, by the Latin development *movi-mentum (moveo ‘move’) > momentum (‘movement changing state’ > ‘moment’).

In its basic features the meaning of time as the general concept comprising the semantics of the two distinct temporal categories aspect and tense, as well as their ontogenetic development, could tentatively (see further below) be formulated in the form of its hierarchical-processual relations to matter, space, and motion (cf. Thelin 1990b: 103):

The concepts of matter and space exist in a relation of mutual dependence. The concept of space presupposes the existence of matter and beings perceiving this matter. Equally, the concept of matter presupposes the idea of extension in space. Perceived space is confined in its extension by perceived matter. The extension of matter itself or the space between various instances of matter (‘things’) is conceived of as distances between its/their ultimate or closest boundaries (points), respectively. Being the fundamental perceptual device for relative (‘subjective’) spatial perspective, the concept of distance has been generalized and subjected to conventional, so-called absolute (‘objective’) measurement in terms of length.
Matter has two forms of existence in space: rest and motion. At rest the distances between things in space are constant, in motion – changing. Motion causes new distances (new configurations of things) and – after its returning to rest – new states. Motion implies thus change of states.

Time as a concept originates in the distance between old and new states, i.e., the extension of motion between 'before' and 'after'. The extension of motion is in inverse proportion to its velocity if related to a given distance: the faster the motion between two states, the shorter its extension and the conceived distance between the two states. Time emerges, in other words, as an abstraction and further development of the concept of extension from bearing upon constant distances in a world at rest, i.e., as a means of measuring them in terms of relations within world states (the spatial dimension: length), to bearing upon variable distances in a world in motion depending on the velocity of this motion, i.e., as a means of measuring them in terms of relations between world states represented by the presumably primitive temporal dimension of duration. Extension of motion subjected to primitive temporal measurement, i.e., as duration, is generalized and subjected to conventional so-called absolute ('objective') measurement in terms of chronological time. Extension of motion, or rather instances of motion, i.e., events, subjected to relative ('subjective') temporal perspective, imply their objectification as things analyzable/manipulatable in terms of their external relations to the observer and other events/things, as well as their internal structure.

8.4 The hypothetical development of temporal distinctions

How is the above understanding of the origin of time as the relative measure of the extension of motion to be brought into a cognitive-logical and genetic relationship with the temporal-perspectival categories of aspect and tense?

8.4.1 Primitive features of time: concreteness, cyclicity, delimitation

To begin with, it appears reasonable to assume that the concept of time originally developed related to observations and, at a later stage, to reports of concrete actions and events taking place in more or less definite locations with definite agents and definite goals or experiencers, as well. Duration became the primordial dimension of time conditioned primarily by, or rather abstracted from, the standard event of the 24 hour cycle of day and night. Indications of longer durations (in terms of days and nights; for example, how long time the hunters had been away from home) must have been prior to the indication of smaller durations or 'points' along the line of extension of, for example, one day. This follows from the elementary condition that partial indications with regard to the cycle could be made only if the latter already existed as the conception of a confined (surveyable) totality. The
further partitioning or specification of temporal cycles must, naturally, have been related to an increasing complexity in perceptual-cognitive and socio-linguistic structure.

It would then seem appropriate to posit that temporal references originated in indications of durations, i.e., in relative measurements of actions and events (and, indirectly, states) reported as taking place (holding) in concrete, definite situations, expressing what has been referred to above (in regard to a later stage of development; see also below) as the aspectual meaning of time-relatedness.

Since measurement of time – by way of its abstraction from standard events – presupposes the delimitation of the duration ascribed to actions and events observed/reported, we may further assume that primitive temporal indications implied the prototype of what has been referred to above as the aspectual feature of totality (+TOTALITY), as well.

8.4.2 Preaspectual perspectival differentiation in terms of wholes and parts and the cognitive distinction between past and present time

Under the circumstances indicated above, original temporal references (in this fundamental preaspectual sense) applied to definite actions and events only in past time, since totality is incompatible with present, i.e., actual, time (cf. also Morin 1942: 172), and the concept of future time has, apparently, to be considered as a later development (transposing the present meaning into the future by means of modality; cf. Thelin 1978a: 25ff.). Now, there is strong evidence, for example, from the Indo-European languages (ibid.: 15ff.) that the cognitive and linguistic distinction past vs. present developed later than the aspectual distinctions. In Greek the remaining basic compatibility of the 'aspectual' aorist with all tenses (except for the indicative that cannot express present meaning; see below) and the function of the imperfect as a secondary variation of the present stem, expressing the corresponding 'processual' (–TOTALITY) aspect meaning in the past, are such pieces of evidence.

It thus seems justified to posit that the different aspectual meanings, underlying, e.g., the Greek aorist and present stem, respectively, had existed prior to tense meanings. Under these conditions one could think of the origin of aspect as a feature not yet associated specifically with the meaning of motion (action) and time but representing a more general distinction holding for man’s perspective on reality, viz., in terms of rather definite patterns of wholes and parts (in concord with Gestalt psychology; cf. Thelin 1985: 163; see 3.8–9). This perspectival analysis would then have applied to actions and objects, as well (cf. the above-mentioned use of the partitive case in Finnish objects as an expression of the partial or 'processual' aspect meaning).
The total view of actions and events as the primary, ‘pure’ aspectual meaning underlying primitive measurements of duration (and reflected later by, e.g., the Greek aorist or Slavic perfective forms) referred then to these actions and events (at least if definite) as past (only later as future) not due to any ‘tense’ distinction (because it presumably did not yet exist as such) but as a consequence of this total preaspectual view. The compatibility of the Greek aorist not only with the past (and future) meaning but also with the present meaning is just a seeming contradiction, since this latter compatibility is valid only for the superordinate (modal) structures of the semantically-syntactically complex aorist forms represented by the subjunctive, the optative, the imperative, and the infinitive, whereas the subordinate (embedded) actions characterized by the total aspectual (truly aoristic) meaning could not be referred to as actually taking place in the present, i.e., simultaneously with the moment of speech. This important fact is evidenced by the non-complex indicative, which could refer only to past (and future) actions, and also by the participle which denoted normally preceding actions with respect to the main action.

8.4.3 The preaspectual concept of totality: from temporal quantification to temporal qualification

Proceeding from the above understanding that indications of durations in terms of natural cycles developed from entire cycles to smaller, delimited parts of cycles, we can now imagine how actions viewed in their totality could be localized along the metaphorically abstracted temporal line and defined successively by such parts of this line (or regular events firmly associated with it), and how the original meaning of totality as delimitation of extension, i.e., duration ‘in time’, was replaced first by a more general total perspective on actions and then through the successive process of temporalization (see 8.1, 8.4.5) by the derived meaning of total association with the ‘temporal line’ (i.e., in reality the line of temporally ordered events referred to by my concept of time-relatedness). By applying it also to non-durational actions the essential function of this feature is changed from having been one of temporal quantification to being one of temporal qualification. Not the extension of an action ‘in time’ but an action’s (perspectival) relation to it thus became the essential cognitive feature of aspectual totality as it developed, prompted by the contrast exercised by the further perceptual-cognitive possibility of qualifying actions also as being in process by ascribing to them a partial relation to time, i.e., by the perspective associating them with it only in one of their parts or phases.

The meaning of totality has often been referred to in aspectology as ‘punctuality’. The latter has even once been regarded as the aspectual essence of the Slavic perfective forms (cf. Dahl 1974). This understanding is
not only incompatible with the hypothetical development sketched above, it is also incorrect. Exactly like Slavic perfective forms (cf. Thelin 1978a: 33ff.), the Greek aorist could express totality irrespective of whether this totality was defined by its references as punctual or durational (delimitedly extensional): *ebasileuse* could mean 'he became a king', but *ebasileuse pentekonta ete* meant 'he ruled for 50 years' (cf. the corresponding observations on Modern Greek and French in Seiler 1969: 124).

8.4.4 The preaspectual concept of partiality: the essence of 'processuality'

Just as total indications with regard to the natural temporal cycles must have preceded partial ones, we may assume that total references to actions and events preceded the partial references underlying the 'processual' meaning. This seems reasonable from the above-mentioned condition that the concept of parts is conditioned by the concept of wholes, and, as we are going to see, from the corresponding relative dependence upon a total perspective manifested by the partial perspective as prototype of the aspeuctual feature –TOTALITY. Actions can thus be described in their totality if referred to a past (or future) point or segment of time. Such 'points’ of reference can be defined by other 'total' actions, simultaneous with or surrounding the given action, and by preceding or simultaneous states and processes as well. In other words, ‘total’ actions can be defined by processes, i.e., partial references, but must not be. 'Partial’ actions, however, must be defined by 'total’ actions or other points of reference (like the moment of speech) allowing for a similar 'confined glimpse' (Thelin 1978a: 31) into their internal structure as the essence of 'processuality' (expressed by the Greek present stem, Slavic imperfective forms and 'continuous' forms in English in their time-related use). Traditional notions like 'progressivity' and, especially, 'durativity' (since duration, in fact, implies delimitation, i.e., totality) obscure this important condition.

The circumstances referred to here are reflected by the roles fulfilled by 'total’ and ‘partial’ actions or events in narration: 'total’ actions, constituting the plot, could theoretically dispense with 'partial’ actions, normally constituting the close background (Thelin 1984a: 226; 1985: 181; see above, for example, 3.12), although this is practically never the case. Narration is normally not conceivable, however, without totality, delimiting actions and events of the foreground from each other and in this way making possible their succession and the progression of the story. For a discussion of the superordinate distinction between these time-related features, i.e., +TOTALITY and –TOTALITY, implicit directly or indirectly in foreground / narration, and the feature of non-time-relatedness implicit in remote background / description, see 8.4.10.3.
8.4.5 The distribution of preaspectual perspective, the rise of the past-present distinction, and temporalization as the genesis of aspect proper

The only perspective applicable to actions in present time, i.e., referred to as simultaneous with the moment of speech, was – as indicated above – originally the partial one. Since the total perspective was restricted first to actions in past time, we may assume that this distribution of perspective was the factor which also cognitively conditioned the rise of the temporal distinction past vs. present (and later the development of the linguistic tense category). Having initially launched this process, the preaspect meanings – as a general (spatial) perspectival distinction in terms of wholes and parts – were then themselves influenced by the growing concept of temporality and successively associated more firmly with the concept conditioning time, i.e., motion and its manifestations as actions and events. This was, in my view, how the temporalization of the original 'pure' aspect or, rather, preaspect meanings, arose and led, as a first consequence, to the proper aspect distinction +/-TOTALITY, specifying actions and events with respect to the character of their perspectival relation to time.

8.4.6 From preaspectual definiteness vs. indefiniteness to the superordinate aspectual distinction time-relatedness vs. non-time-relatedness

Even before temporalization, the general perspectival distinction, which applied to actions as well as objects by referring to them as definite (concrete) patterns of wholes and parts, presumably underwent a process of generalization, abstracting from reality as instanced by directly perceivable actions and objects and allowing of references to them as indefinite patterns in terms of experientially derived general conditions and classes. With regard to actions and events this feature of indefiniteness presumably developed as a consequence of a growing cognitive distinction between their uniqueness and non-uniqueness, respectively. Thus the temporalization probably implied that the distinction definiteness vs. indefiniteness linked uniqueness of an action to the idea of a concrete or individual situation defined by specific references associating the action with a definite segment of the metaphorically abstracted temporal line (i.e., the cognitive-semantic feature of time-relatedness), and linked non-uniqueness of an action to the idea of general validity holding, for example, by force of its repeatability, habituality or potentiality, and defined by lack of specific references, thus dissociating it from time (i.e., the cognitive-semantic feature of non-time-relatedness). Nota bene, 'time' and 'temporal line' understood here as the metaphorical abstraction of the line of temporally ordered events.
A fundamental role in this development was assumedly played by the observer’s spatially based differentiation of events as to their immediate vs. mediate relevance in concrete situations, viz., as belonging to the foreground of state-changing events or to the background of subsidiary events and conditions, respectively. This differentiation, which is represented by the temporally definite course of events (cf. the plot line), on the one hand, and temporally indefinite events beyond it, on the other, may, in view of its obviously spatial origin (cf. also the intermediate close background of temporally definite events), be assumed to have preceded the process of abstraction leading to temporal indefiniteness (non-time-relatedness) in cases of, for example, habituality and genericity. The latter are usually beyond the immediately perceivable background of a concrete situation and corresponding short-term memory, and represent what has been referred to here as the remote background.

Thus completing the system of basic aspectual distinctions, the opposition time-relatedness vs. non-time-relatedness was eventually to occupy its superordinate hierarchical position, being specified further – in cases of time-relatedness – by the subordinate distinction +/-TOTALITY with regard to the given type of time-relatedness. Thus, in contrast to my hypothesis in Thelin (1978a: 18ff.), the above analysis gives cognitive-genetic priority to the more concrete opposition +/-TOTALITY as compared with the resulting system-inherent superordinate status of the opposition time-relatedness vs. non-time-relatedness (specified further in terms of change-of-state conditions and corresponding foreground-background functions).

8.4.7 The rise of tense distinctions

Let us now return to the rise of the tense distinctions, which were conditioned first by the preaspectual distinctions and then contributed in turn to the temporalization of the latter. In accord with the idea that a cognitive and linguistic distinction appears either as a consequence of further specification (‘totality generates partiality’) or, conversely, as a consequence of a generalization (‘definiteness generates indefiniteness’) of original features, we may assume that the pretense distinction past vs. present developed as a further specification, starting from the concept of past time as marked by the primary preaspect feature of totality. This is to be understood in such a way that the preaspectually conditioned appearance of the temporal concept of ‘past’ was a prerequisite of contrast for the present (i.e., moment of speech) to become the temporal concept of ‘present’ (‘past generates present’) as well.

The temporal concept of present as defined in contrast with past was now associated with the only preaspectual feature applying to the present, viz., partiality, as opposed to the feature of totality associated with the past.
8.4.8 The hypothetical development of temporal distinctions: Summary of its cognitive-genetic stages (conceived as a process of increasing complexity with considerable over-lap)

I. The concept of time as an instrument for the measurement of duration

1. **Cognitive features**
   a. Basic features: definiteness, the general perspectival distinction in terms of wholes (preaspectual totality) and parts (preaspectual partiality), motion.
   b. Motion-oriented features: cycles, extension, delimitation.

2. **Developments**
   a. The preaspectual totality perspective, applied to motion, gives rise to the past time perspective as the cognitively marked feature of temporal order.
   b. The preaspectual totality perspective as the cognitive instrument for delimiting extension in terms of cycles or parts of cycles, i.e., for temporal quantification, becomes successively the instrument for a more general total perspective on motion.

II. The concept of time as an instrument for preaspectual perspectival differentiation

1. **Cognitive features (applied to motion):** definiteness, the preaspectual totality perspective, the pretense past time perspective.

2. **Developments**
   a. In accord with the general perspectival distinction in terms of wholes and parts, motion-related preaspectual totality is followed by its equi-pollent opposite partiality as an expression of the growing concept of a 'processual' perspective.
   b. The definite perspectival differentiation of motion (in terms of preaspectual totality vs. partiality) is balanced by the further possibility of indefinite references to motion.
   c. The preaspectual concepts of totality and partiality, correlated to past and present motion, respectively, give rise to the cognitive pretense distinction past vs. present.

III. The concept of time as the complex instrument for two interrelated but distinct modes of perspectival differentiation: temporal quality (or 'contour'; cf. Hockett 1958: 237), that is, aspect, and temporal order, that is, tense.

1. **Cognitive features (distinctions):** definiteness vs. indefiniteness, preaspectual totality vs. partiality, pretense past vs. present.

2. **Developments**
   a. Correlated with the pretense perspectival distinction past vs. present, the preaspectual distinction totality vs. partiality is associated more firmly with time as the instrument for the perspectival differentiation of motion, i.e., actions and events, not regarding their order 'in time' (as in the
former case), but regarding their relation to time itself, viz., their temporal quality (as opposed to primitive temporal quantity).

b. The distinction definiteness vs. indefiniteness, accordingly, as a consequence of temporalization, now applies to the relation of actions and events to time, viz., by superimposing on the distinction defining the specific character of this relation (in terms of totality vs. partiality) the more general perspectival distinction as to whether or not actions and events are defined by such specific relations to time, (i.e., time-relatedness vs. non-time-relatedness, and corresponding distinctions based on change-of-state conditions and foreground-background functions).

c. Along with the development of aspect proper, the pretense concept of temporal order in terms of past vs. present becomes successively the cognitive distinction underlying tense proper. Tense distinctions are then to occupy, in the hierarchical overall system of time semantics, a position subordinate to aspect distinctions since they are dependent on the latter: higher degrees of non-time-relatedness (remote background) thus preclude tense differentiation completely, and time-relatedness, specified as totality, predicts the inappropriateness of (actual) present meaning. For a discussion of the cognitive-semantic status of the category of *taxis* in relation to aspect and tense, see Ch. 7 and Ch. 9; see also 4.2, 4.5, 4.8.

8.4.9 The Indo-European trichotomy aorist-present-imperfect

The state of affairs resulting from temporalization, i.e., the two aspect meanings of totality and partiality correlated to the two tense meanings past and present, respectively, characterizes in Indo-European a stage of development represented basically by the *aorist-present* dichotomy. The genesis of the *imperfect* was a natural step to assure primarily the expression of partiality (‘processuality’, i.e., –TOTALITY) in past time also. Its past time ‘partner’ – the aorist – as a consequence partly of its new role as the opposite of the restrictedly past-time-related imperfect, was henceforth to lose successively its basically tense-independent status (holding for Vedic Sanskrit, for Greek only in a restricted sense) and become an aspect-tense expression usually associated exclusively with past time (as in Slavic).

8.4.10 The universal nature of the aspect distinction time-relatedness vs. non-time-relatedness

The distinction *definiteness vs. indefiniteness* and its above reinterpretation with respect to actions and events as a consequence of temporalization, viz., as time-relatedness and non-time-relatedness, respectively (cf. also Thelin 1978a: 19ff., 30ff.), should now be integrated further into the cognitive-genetic hypothesis of time semantics sketched so far. Without this distinction (and corresponding change-of-state conditions and foreground-background
functions) the universal phenomenon of aspect and its origin would remain a mystery.

8.4.10.1 The mechanisms of temporal abstraction

It is interesting to note that Plotinus (Ennead III.7.1.20; cf. Beierwaltes 1995), referring to Plato’s understanding of time as ‘an image of eternity’, points to the possibility of describing the relation between them by proceeding the other way as well, i.e., from time to eternity. By regarding eternity as the ‘archetype’, Plotinus thus gives implicit support to an analysis that treats non-time-relatedness as the abstraction of primary time-relatedness. This condition is reflected by the circumstance that the most abstract meanings of non-time-relatedness refer rather to ‘all times’ (as in cases of, e.g., ‘eternal truths’, gnomes, etc.), whereas less abstract meanings (as the generic, habitual, and ‘simple denotative’ meanings) may be differentiated with regard to tense. In the former case I have spoken of a complete removal from the temporal line (per se abstracted metaphorically from the course of temporally ordered events), in the latter case of different degrees of abstraction from it (see 8.1; cf. Thelin 1978a: 30–31, 65–66; 1984b: 227).

8.4.10.2 St. Augustine, Ricoeur, and the hierarchization of time

It is certainly no coincidence that Ricoeur (1983: 41ff.; see 8.2) in his insightful analysis of Augustine’s treatment of eternity and its implications for the concept of time, independently comes to a similar conclusion, ascribing to the latter’s meditation on eternity the function of contrast (“idée-limite qui contraint à penser à la fois le temps et l’autre du temps”; compare my opposition time-relatedness vs. non-time-relatedness), intensifying “l'expérience même de la distentio au plan existentiel” (i.e., time-relatedness) and causing it at the same time to approach eternity and “donc à se hiérarchiser intérieurement, à l’encontre de la fascination par la représentation d’un temps rectilinéaire.”

Ricoeur certainly has come to his conclusion from his analysis of the specific conditions holding for the distinction between Augustine’s concepts of the eternal Word of God (Verbum) and the temporal voice of man (vox), and assigning to the Word as instruction an internalized function, mediating between them; but his further generalization of these conditions is in harmony with the understanding above of the distinction time-relatedness vs. non-time-relatedness and its constitutive role in narration: “Pérégrination et narration sont fondées dans une approximation de l’éternité par le temps, laquelle, loin d’abolir la différence, ne cesse de la creuser” (ibid.: 52).

The intensification of temporal experience achieved by the contrast of eternity and time is understood by Ricoeur as leading to an internal hierarchization of time (represented by the feature time-relatedness), since he
sees it in opposition to the specific concept of eternity. This is just a seeming difference between our analyses which disappears, naturally, if we (in view of a more general linguistic-poetic application) prefer to see eternity as just one of the possible meanings representing non-time-relatedness, albeit the most abstract one. Under these circumstances we can thus establish a rather good equivalence between “different degrees of abstraction from the time axis” (Thelin 1978a: 65) and Ricoeur’s (p. 51) “hiérarchie de niveaux de temporalisation, selon que cette expérience s’éloigne ou se rapproche de son pôle d’éternité.”

8.4.10.3 Strategies of narration and the enriched temporality

It is remarkable, but not really surprising, given this background, how Ricoeur’s analysis, proceeding from Augustine’s meditations on time and eternity, and the present cognitive-semantic analysis of aspect have arrived at such a close understanding of time and the character of its constitutive role in narration. It is symptomatic that both analyses lead to a similar generalization, connecting the temporal (basic aspectual) distinctions discovered with corresponding different strategies of narration. This circumstance is evidenced by the perspectival interpretation of the innovative element in Čechov’s prose, viz., in terms of the relations of interplay holding between foreground and background structures of narratio and descriptio, respectively (Thelin 1984b: 230; 1984a: 271ff.). Proceeding from Pomorska’s (1976) observation that this innovation is based on “abandoning the representation of ‘events’, that is, the usage of perceivable, discrete units, and replacing them by ‘non-events’ or units unmarked in the perception of the reader”, I thus suggested for these two modes of narration the application of the aspectual-semantic distinction between time-relatedness and non-time-relatedness, respectively. Proposing for Čechov’s type of prose the notion of ‘narrative inversion’, I characterized the effect of replacing narratio (time-relatedness) by descriptio (non-time-relatedness) as an increasing tension (or oscillation) between them, assigning to conventional descriptive (background) structures a “dynamic-pregnant perspective”. The above analysis is paralleled by Ricoeur’s generalizing conclusion: ”S’il est vrai que la pente majeure de la théorie moderne du récit […] est de ‘dechronologiser’ le récit, la lutte contre la représentation linéaire du temps n’a pas nécessairement pour seule issue de ‘logiciser’ le récit, mais bien d’en approfondir la temporalité [my emphasis].”

As demonstrated by Peter Alberg Jensen (1990) in his important study of aspect usage in Čechov, the novelty in the art of story-telling that Čechov achieved by displacing the narrative centre of gravity from the conventional foreground to the background pertained typically also to what I have called the close background (and defined as temporally related to the foreground). In my interpretation of this narrative strategy of foreground suppression, the predominant partial (–TOTALITY) aspectual perspective on events, i.e., as
being in process, along with the corresponding close-up perspective on things (see the end of this section), convey, accordingly, immediate impressions to which Čechov thus lends a peculiar sense of fateful coherence and (indirect) narrative development. The question arises, of course, whether the close background here – as a result of the suppressed foreground and the omission of expected state-changing events – does not in a sense take over the role of foreground, or at least play a role similar to the one of foreground-embedded ongoing events (referred to above merely with regard to the actual present; see 3.13, 4.6.1, Ch. 7).

Such instances of perspectival manipulation in literary texts disclose to a considerable extent the general working of time as a crucial part of the complex of human cognitive activities, and are thus equally relevant to our understanding of ordinary text-construction and text-interpretation. They further indicate the need for models that correlate text structures (spoken as well as written) and interpretations of world structures in ways that simulate the processual coherence between perceptually, cognitively, and semantically structured worlds. That such a correlation, transcending traditional autonomous linguistics, is also necessary for a deeper understanding of central linguistic functions is demonstrated most persuasively precisely by the temporal organization of narrative texts.

Preliminary observations on the decisive connection between aspect functions and compositional structure were, actually, made by Vinogradov (1937), who ascribed to the perfective aspect forms in Russian a high degree of narrative dynamism. He derived the latter, rather intuitively, from what he called ”the semantic kernel” of the past perfective. He also characterized the past imperfective as ”creating a spatial perspective in the narration” or ”in free contour a broad ground for the past”. For an equivalent observation in terms of a ”tempo-distinction”, see Jespersen (1924: 276, 287; see 4.2).

Although Vinogradov’s observations express an inductive understanding and thus reflect a text-interpreting rather than a text-constructing process, they are important and raise with due force the question how aspect forms can indeed fulfil these narrative functions. After all, what is the content of the ”semantic kernel” of aspect?

It is obvious that traditional aspect theories, based on one single, usually privative, opposition, like ‘perfective vs. imperfective’, ‘totality vs. non-totality’, ‘achievement vs. non-achievement of a terminus’, or, for that matter Jakobson’s ‘completion vs. non-completion’, are incapable of being related cognitively and semantically to the narrative functions discussed.

In this sketch of the empirical background, let me refer briefly to some further observations no less important for our understanding of aspect functions in narration. In his early explication of the notion of fabula, Tomaševskij (1928), deviating from Šklovskij’s view, laid the foundation of a fertile hypothesis in regard to the distinctive status of narrative structures by proceeding from their temporal differentiation in a more genuine, but still im-
plicit, aspektual sense. By thus distinguishing his "'narrating’ system of causally-temporally coherent dynamic motives” from the "'describing’ system of non-coherent, static motives”, Tomaševskij, in fact, widened the sense of temporal differentiation from variation in the definite temporal order of events to the possibility of no such order, i.e., temporal indefiniteness.

Accordingly, one can say, and rightly so, that Tomaševskij more than 80 years ago actually anticipated, in essence, the understanding of aspect as a matter of temporal status (as distinguished from temporal order), and, more specifically, the cognitive-semantic distinction underlying the aspect theory applied here, viz., the fundamental distinction between time-related foreground events (i.e., narratio), on the one hand, and non-time-related (remote) background events (i.e., descriptio), on the other. According to the model developed here (see 3.12), an intermediate position, although closer to the foreground than to the remote background, is occupied by the close background, the events of which are temporally related (normally simultaneous with) the state-changing events of the foreground.

The latter distinction was missing in Vinogradov’s conception of the background and the spatial depth that he intuitively associated with it (as "a spatial perspective in the story") clearly pertains to what may be understood as the remote background. His observation of the latter’s character of "free outline” is important, since it connects naturally the (remote) background with the sketchy, non-distinct nature of the Gestalt notion of ground as distinguished from the focal, detailed nature of figure (see 3.8).

On the basis of such empirical evidence, and the assumption of time’s origin in space, it would not appear far-fetched to expect the perspectival distinctions that apply to events, i.e., more specifically in terms of aspektual time (indeed, space/time), to also apply fundamentally to things. In other words, would it not be logical to assume that the interpretation of things and their spatial relations is correlated to the given aspektual-temporal perspectival and its narrative function? In the same way as the temporal perspectives of the foreground and the close background imply an incisive analysis of events in their totality and partiality, respectively, we might thus expect the spatial perspective to imply in these situations an equivalent, incisive analysis of things and their relations, namely as an expression of spatial proximity – opposed to the spatial remoteness of the 'proper’ background. Such a correlation was unknown to traditional aspectology, but preliminary observations of Russian narratives (Puškin and Dostoevskij) indicate that this is indeed the case (cf. also the quotation of Kristeva above, 8.1). According to my working hypothesis, the presentation of things and their spatial relations in the foreground and close background is thus characterized by what might be conceived as a close-up perspective, while the remote background is characterized by a wide-angle perspective. It is noteworthy that in the comprehensive volume The Construal of Space in Language and Thought (Pütz
and Dirven 1996) there is no single reference to the role of spatial perspective in narration as correlated with aspectual-temporal perspective.

8.5. Modern aspectology and Bergson’s philosophy of time

To draw a parallel between the distinction between non-time-relatedness and time-relatedness and Bergson’s (1889; cf. also 1923: 54ff.) concepts of temps réel (or durée-qualité) and ”temps [...] materialisé, devenu quantité par un développement dans l’espace”, respectively, would not seem fully justified (see 4.6.1 and 4.6.4.2). Bergson’s temporal concept of ”durée-qualité” cannot thus be considered as equivalent to the aspectual concept of backgrounding and non-time-relatedness (cf. Jensen 1990: 401ff.). To Bergson this concept implies the basic notion of permanent and indivisible continuity (cf. also Bergson 1911b: 32), and as such is always constitutive of reality (motion) and also of mind (cf. Morin 1942: 170). In contrast to the abstract cognitive-semantic feature of non-time-relatedness (genetically developed by abstraction from time-relatedness), Bergson’s durée-qualité expresses a rather concrete hypothesis of the ontological reality underlying mental processes and their external objects of perception (compare: temps réel), namely as permanent change. Therefore, while completely lacking an equivalent of the concept of aspectual non-time-relatedness, Bergson’s time theory proceeds instead – in the shape of durée-qualité – from what might perhaps rather be called an intuitive prototype of aspectual time-relatedness. In fact, the subsequent intellectual interpretation would rather operate upon this underlying mobile and indivisible continuity (understood, notably, by Bergson as time), viz., by means of localistic (stationary) perceptual strategies, reflected by the aspectual processes of totalization and partialization, suggested above as realizations of time proper. However, understood by Bergson as indivisible continuity, his idealized ’real’ time does not grant the coherent, cognitive-logical relationship with temporal (aspectual) discontinuation offered by the non-temporal, homogeneously divisible continuity assigned to chaos by way of biological rhythmization (see 3.11 and 4.6.4.2). With these reservations, Bergson’s philosophy of time may be understood to give general support to the present Gestalt-psychological analysis (see 3.8–9) of the essential perceptual-cognitive mechanism underlying the equipollent aspectual opposition +/–TOTALITY, i.e., as an expression of total (delimiting) references in cases of state-changing events, and partial (phasic) references in cases of ongoing processes, respectively; cf. Bergson (1911b):
The mechanistic instinct of the mind is stronger than reason, stronger than immediate experience. The metaphysician that we each carry unconsciously within us [...] has its fixed requirements, its ready-made explanations, its irreducible propositions: all unite in denying concrete duration. Change must be reducible to an arrangement or rearrangement of parts (p. 18).

The real whole might well be, we conceive, an indivisible continuity. The systems we cut out within it would, properly speaking, not then be parts at all; they would be partial views of the whole (p. 32).

Of becoming we perceive only states, of duration only instants (p. 288).

The primal function of perception is precisely to grasp a series of elementary changes under the form of a quality or of a simple state, by work of condensation (p. 317).

It should be evident that Bergson’s references to the “whole” and to “parts” pertain here to the whole of continuity and to partitioning (of this whole) in the superordinate (indeed, Gestalt) sense, respectively, thus covering in the latter case both totalizing (delimiting) and partializing (phasal) aspectual references to individual events, i.e., +TOTALITY vs. –TOTALITY. The interesting thing is that Bergson, by speaking of “partial views” (rather than “parts”), not only gives expression to his deep understanding of the mechanisms of perception but also supports the case for drawing on these mechanisms for a cognitive-semantic theory of aspect, and, accordingly, for founding the latter on a perspectival philosophy of time.

Understood as a matter of system-inherent hierarchization, Bergson’s distinction between intuitive time and intellectualized (materialized, spatialized) time is, as we have seen, still in accord with the aspect model suggested above and can be regarded as a system based rather on time-relatedness and its further localistic specification, i.e., according to this model, in terms of the opposition +/–TOTALITY. However, if understood also as a hypothesis of cognitive-genetic development, Bergson’s distinction would conflict in this respect with the assumption underlying the present analysis, namely that temporal meanings develop from spatial ones.

8.6 Summary

As a prerequisite for our understanding of temporal functions in narrative texts, the categories of aspect and tense are analyzed above as two particular kinds of perspective on reality. Interpretations of reality are understood to be characterized primarily by the aspectual distinction between temporally definite (time-related) and temporally indefinite (non-time-related) events. This distinction is, more precisely, treated as an abstraction of the primordial aspectual (spatial/temporal) foreground vs. background distinction (and corresponding change-of-state conditions; see 5.6) and as the correlations of this.
situational-aspectual distinction with the event-aspectual (spatial-temporal) distinction totality vs. partiality.

By proceeding critically in the footsteps of St. Augustine, one of the most important precursors of modern temporal theory, we are in a position to expose the reason for his failure (like almost all of his followers’) as precisely an aspectual one, namely his ignorance of the totality-partiality distinction. Without the insight that the measurement of time implies a delimitation by way of aspectual totality, Augustine is forced, by the incompatibility of time as a measure of extension with the present (as distinguished from the past and the future), to deny the existence of time, or, alternatively, to postulate its existence in the present exclusively on the psychological level. This obviously asymmetrical solution, irreconcilable not only with the present hypothesis that time in general is a cognitive construction, but also with the specific perceptual-cognitive nature of true present, i.e., aspectual partiality, is no doubt caused by Augustine’s tense-based understanding of time merely as duration.

According to the hierarchical-processual model suggested here for the ontogeny of temporal distinctions (supported, in turn, by phylogenetic capacities of general nature, as well as patterns and strategies of perception and cognition conveyed by cultural learning, including actional and linguistic structure), duration is of fundamental significance. However, it is so merely as the point of departure for the further development of time as genuine instrument for perspectival differentiation, i.e., by means primarily of aspect and tense. With regard to the aspectual feature of totality, this development is characterized as one from temporal quantification to temporal qualification.

In this light, the constitutive role of time, in particular in its guise as aspect, in the perspectival organization of narrative texts is discussed in outline and related to pertinent observations in previous poetic-linguistic and philosophical work.
9 Aspect, tense or, taxis? – The meaning of the perfect reconsidered

Notwithstanding the considerable progress in recent research on the categories of aspect and tense, the meaning of the perfect has to this day defied an unambiguous integration into any of these two categories. By further developing Roman Jakobson’s concept of taxis and revising its still aspect-dependent application to the perfect meaning by Jurij Maslov, the following treatment will arrive at the conclusion that a systemically independent category of temporal meanings correlated hierarchically with aspect and tense, should be postulated, namely the category of taxis.

Given the new cognitive-pragmatic instruments available for exploring the concept of time and the two grammatical categories intimately connected with time, aspect and tense, it seems opportune to return to the hitherto unsolved problem of the meaning of the perfect and its systemic grammatical status.

It is symptomatic that there is no agreement among linguists as to whether the perfect or, rather, the system of meanings that it comprises, belongs to the category of aspect or to the category of tense (cf. Maslov 1962; 1984; Comrie 1976, 1985; Thelin 1978a: 4ff.; Mourelatos 1981: 185; Steedman 1982: 141; Andersson 1984). It would appear that none of the existing theories of aspect and tense has so far succeeded in unambiguously establishing the cognitive-semantic essence of the meaning of the perfect.

It is therefore not surprising that in the most frequently quoted handbook on aspectology (Comrie 1976: 52) the perfect is ascribed aspectual status for largely conventional reasons: "[G]iven the traditional terminology in which the perfect is listed as an aspect, it seems most convenient to deal with the perfect in a book on aspect, while bearing in mind continually that it is an aspect in a rather different sense from the other aspects."

Comrie’s treatment, despite the clear reservations he states, is without theoretical foundation. In fact it contradicts the definition of aspect and tense formulated by the author himself (Comrie 1976: 5; cf. Vater 1980; Andersson 1984: 200), according to which the perfect would pertain rather to the tense category: "Aspect is not concerned with relating the time of the situation to any other time-point, but rather with the internal temporal constituency of the one situation; one could state the difference as one between situation-internal time (aspect) and situation-external time (tense)."
For Comrie (1976: 52) there thus exists a "perfect aspect" (cf. also Friedrich 1974; Li et al 1982; Hewson and Bubenik 1997: 1–23) as the expression of "a relation between two time-points, on the one hand the time of the state resulting from a prior situation, and on the other the time of that prior situation." This "aspect", according to Comrie (1976), inheres in the present perfect, the past perfect, and the future perfect.

According to Maslov (1984: 32ff.), the opposition perfect vs. non-perfect may pertain either to aspect or taxis, or may imply a combination of the semantics of both. By applying Jakobson’s concept of taxis ("taxis characterizes the narrated event in relation to another narrated event and without reference to the speech event"; cf. Jakobson 1971 [1957]: 135) to the description of the perfect, Maslov (1984: 7), in my view, takes an important step toward a solution of the classical issue of the perfect. Although his proposal still suffers from certain contradictions to be shown below, Maslov’s distinction between aspect and taxis makes it possible to treat – as a first attempt – what Comrie and others regarded as an isolated "perfect aspect" as the semantic component of taxis partaking of the perfect meaning and belonging neither to the aspect category nor to the tense category. Taking this hypothesis as a starting point, let us turn now to the obvious problems still inherent in Maslov’s proposal and see whether they can be removed and further steps taken in a more productive direction.

In the first place, what does Maslov mean by the "aspectual content" of the perfect? If, in his view, the opposition perfect vs. non-perfect is a privative one, we must assume that the perfect (as the ‘marked’ member) necessarily carries a definite invariant meaning (understood below rather in a non-marked, simple componential fashion; cf. Timberlake 1982: 305, 309, 328). This assumption is supported not only by Maslov’s understanding that through "the [historical] change of the perfect into the non-perfect preterite not only the aspect but even the taxis characteristics were lost completely" (Maslov 1984: 34), but also by the fact that he does not include the tense category in the content of the meaning of the perfect. But this leads us to ask which semantic component is the invariant one, if as Maslov maintains, "the content [of the perfect] can pertain either to aspect or to taxis [my emphasis]". Is it at all possible, under these circumstances, to speak of the perfect as a specific functional-semantic entity with qualifications for a cross-linguistic grammatical status (cf. Dahl 1985: 129ff.)? Presumably we will have to designate one of the two components as the invariant one and regard the other as freely interchangeable (within the complex time semantics of perfect forms).

For this purpose let us examine more carefully the "aspectual content" of the perfect postulated by Maslov. Apparently, he is concerned here above all with what he calls the meaning of 'accomplishment’ or ‘attainment of a terminus’ (Maslov 1984: 7). This interpretation is endorsed by his statement that "the aspectual meaning prevails in the stative perfect", representing,
according to him (p. 36), "the denotation of an attained state". Very illuminating in this connection is Maslov’s (1981: 253–56) description of the Bulgarian perfect: "The meanings of the perfect appear most completely when it is formed within the perfective aspect [my emphasis]". Of the perfect in the imperfective aspect he says that "its use is somewhat more restricted than the perfect of the perfective aspect. For one thing, it cannot have the meaning of state in the present, but functions always as a perfect of action."

The careful reader will doubtless not overlook the ambivalence of these statements as to the semantics of the perfect. If the characteristic aspectual content of the perfect is defined as the "attainment of a terminus (state)" of the perfective (PF) aspect forms, we must conclude either that the perfect of imperfective (IPF) aspect forms is not a typical expression of the perfect meaning or that the perfect meaning of IPF aspect forms pertains exclusively to taxis. Both conclusions, however, are unacceptable: the first because the basic perfect, i.e., according to the view proposed here, the taxis meaning, is always also present in IPF aspect forms; the second because these also represent a definite aspectual content.

Consequently, the aspectual content of the IPF perfect can function as a direct opposition to the aspectual content of the PF perfect. According to the aspect theory underlying the present analysis, IPF forms of the perfect in Slavic represent a polysemous expression of either non-time-relatedness, i.e., remote background (a meaning often referred to as habitual or ‘general-factual’; cf. Thelin 1978a: 17, 30; Maslov 1984: 41), or time-relatedness specified further by aspectual partiality (–TOTALITY), i.e., close background or foreground embedding (see Ch. 10). The cognitive-semantic content of aspectual partiality implies a reference to one or more (potential) parts, or, rather, phases of an event and corresponds to the meaning traditionally referred to as ‘processual’. Events characterized by ‘processuality’ are expressed more or less unambiguously by the English perfect progressive (She has been singing), whereas, for example, the corresponding Russian translation Ona pela (‘she sing-IPF-preterite-feminine’) is clearly polysemous and expresses (besides, of course, the non-perfect preterite) the meaning of the perfect either with the aspectual features of time-relatedness and partiality, i.e., –TOTALITY (as in the case of the English perfect progressive) or with the aspectual feature of non-time-relatedness (remote background) in cases of, for example, habituality and the so-called ‘general-factual’ meaning. The latter feature of non-time-relatedness is conveyed by the English expression has sung, which, in turn, is polysemous, too, since it can also express time-relatedness specified by aspectual totality (+TOTALITY), i.e., foreground, conveyed by the Russian PF perfect:
(9.1a) time-relatedness, –TOTALITY (close background or foreground embedding)

What has Mary been doing this afternoon? – She has been singing all the time.

Što delala Meri posle obeda? – Ona vse vremja pela (IPF)

(9.1b) time-relatedness, +TOTALITY (foreground)

When is she going to sing "The last rose of summer"? – She has sung it already. In the first half of the concert.

Kogda ona budet pet' "Poslednju rozu leta"? – Ona ee uže spela (PF). V pervom otdelenii koncerta.

(9.1c) non-time-relatedness (remote background)

Could you sing us "The last rose of summer"? – Oh, I’m sorry. I have sung that song, but it was long ago. I can’t remember the words.


The restricted relationship between aspect meanings and aspect forms in the present perfect of English (unless replaced in 9.1b and 9.1.c by the polysemous preterite sang; see below) and Russian, as well as the different conditions of polysemy holding for them, is elucidated by the following scheme:

(9.2)
To avoid misconceptions it should be clarified at this point that the meaning of non-time-relatedness, according to the present aspect theory, refers not only to events completely 'removed from time' (as in cases of gnomic expressions, 'eternal truths', certain kinds of genericity, and so forth), but also – in the hierarchical system of temporal abstraction – to events whose relation to time (expressed by a definite tense) simply lacks the feature of concrete-situational localization. The latter condition pertains to cases of 'general factuality' or 'simple statement' ('simple denotation'), as well as to habituality and backgrounded iterativity.

On the basis of this preliminary analysis it appears problematic to speak of any "specific aspectual content" (cf. Maslov 1984: 34) underlying the basic meaning of the perfect. On the contrary, we must assume that the invariant meaning of the perfect pertains exclusively to the concept of taxis (to be developed further below) and can be combined freely with any aspectual meaning (and, as we shall see, tense meaning, as well), irrespective of whether it receives an explicit expression or not. Under these circumstances we are entitled to attribute the various meanings of the perfect (i.e., the meanings of 'state', 'result', 'action', and so forth) primarily to such factors as specific verb semantics and situational conditions (cf. Bryan 1936: 369; Maslov 1984: 33). The fact that there is an unmistakable connection between the 'perfect of state' and the aspectual content of PF aspect forms may be regarded not as a systematic relation of dependence between the aspect category and the perfect meaning as such but rather as a natural expression of the pragmatic condition that actual states – especially situationally concrete states – are as a rule conceived of as results of events that are time-related and, once accomplished, surveyable in their totality, i.e., characterized by the aspect feature +TOTALITY and therefore expressed by Slavic PF forms of the perfect (or polysemous preterite).

The theoretical framework sketched so far does not exclude the possibility that the formal expression of the perfect may be restricted precisely to the above-mentioned connection, with the result that it would appear only with PF aspect forms. According to Comrie (1976: 63) this is the case in Modern Greek. The interpretation of these conditions suggested here harmonizes with Seiler's observations that the (rather restricted; Seiler 1952: 148) Modern Greek perfect denotes "the state resulting from an action" (p. 81) and "appears only in an actualized situation" (p. 90; my emphasis). Under such circumstances the other aspect meanings in Modern Greek would be left unexpressed by the formal perfect and be expressed with the corresponding meaning of taxis either by the polysemous preterite forms of the aorist (in cases of non-time-relatedness, i.e., as expressions of the 'general-factual' meaning in the restricted sense of non-time-relatedness sometimes also referred to as 'simple denotation') or the imperfect (in cases of time-relatedness and –TOTALITY, or of non-time-relatedness, i.e., as expressions of 'processuality', on the one hand, and habituality and backgrounded iterati-
tivity, on the other). In a similar way the basic meaning of the perfect, expressed systematically by forms of the present perfect in British English, tends in American English to be conveyed more frequently by forms of the 'simple past' (cf. Comrie 1976: 53–54; for a discussion, see McCoard 1978: 241–46). This is no reason, however, to deny the relevance of the meaning of the perfect to American English (or, to Russian, for that matter, with its single preterite), i.e., as a cognitive-semantic entity of cross-linguistic status. Conversely, it is certain that the non-perfect preterite meaning will survive as one of the basic meanings of perfect forms in those cases where the latter have replaced the original preterite forms (as in spoken French and certain German dialects).

Having thus argued for the neutrality of the basic meaning of the perfect in relation to the aspect category, let us now turn to the cognitive-semantic content of taxis in the perfect and its relation to the tense category.

As a point of departure let us choose the assumption that the perfect meaning is based on a more or less concrete relation between an actual (present, past, or future) state (cf. Friedrich 1974; Li et al. 1982: 22; Steedman 1982: 142) and an anterior event (action or state). How is this relation to be understood?

Through a criticism of Reichenbach’s (1966: 287–98) tense theory (cf. Thelin 1978a: 40ff.; see also Steedman 1982: 141), it has become clear that the historically based, complex morphological shape of the perfect (still conserved in many languages) has a correspondence in its complex underlying cognitive-semantic structure. By concentrating mainly on the so-called ‘past’ event and regarding the function of actual relevance only as the former’s ”reference” or ”orientation” (cf. Stankov 1969: 74) to the moment of speech, Reichenbach and his numerous successors (for example, Smith 1978: 44, 46, 53ff.) apparently failed to grasp the cognitive-semantic essence of the perfect, namely that it is a hierarchically complex predicate consisting of two systemically independent entities: one past, or, rather, anterior event, and one present, or, rather, actual state of (the former’s) relevance.

For the actual state we will in fact have to establish not only its systemic independence but also its structural, i.e., hierarchical superiority to the anterior event (the latter view indicated, actually, also by Steedman 1982: 142, in his tense treatment of the ‘past’ event). This important condition will be demonstrated by the following analysis of the differences between the present perfect and the non-perfect preterite, on the one hand, and the present perfect and the past/future perfect, on the other. This analysis is based on the pragmatically well-founded assumption (cf. Leech 1969: 147; Hajičová et al. 1970: 9–42; Thelin 1978a: 40ff.) that any simple tense or complex tense-taxis definition of an event always takes the moment of speech (s) as its primary point of orientation (r1).

By applying the principle just stated to Reichenbach’s symbolic language (referred to below under “a”) and, in so doing, substantially revising (under
"b", "c", "d") his theory, I can now represent an event in the ‘simple’ non-perfect preterite as follows (r = point of reference or orientation; e = event; s = the moment of speech):

(9.3) The Non-Perfect Preterite

(9.3a)  \( r, e \rightarrow s \)
(9.3b)  \( (r2) e \rightarrow r1 \quad (=s) \)

We see that, by ignoring aspectual conditions (cf. also the criticism in Timberlake 1985), Reichenbach does not account for the fact that the past point of orientation (i.e., in the present analysis, the secondary point r2 put in brackets) may be lacking, namely if the event is characterized by the aspectual feature of non-time-relatedness.

The present perfect is described by Reichenbach as an "event […] before the point of speech, but it is referred to a point simultaneous with the point of speech, i.e., the point of speech and reference coincide." His symbolic representation is as follows:

(9.4) The Present Perfect

(9.4a)  \( e \rightarrow s, r \)

Taking, instead the moment of speech (s) as the permanent primary point of orientation (r1), the above analysis in fact would imply that in the past one single event, in the present two points of orientation, are represented:

(9.4b) Implications of Reichenbach’s Analysis: \( e \rightarrow r1 \quad (=s), r2 \)

This analysis is logically unacceptable, since it is inconceivable that we should need two simultaneous points of orientation. On the other hand, if we remove the second point of orientation, we would simply get a structure identical with the non-perfect preterite in its non-time-related use (i.e., \( e \rightarrow r \quad (=s) \); see above). Consequently, the only possibility left is to postulate an independent event instead of the second point of orientation, or, rather, a state simultaneous with the moment of speech:

(9.4c) Toward A Tense and Taxis Solution: \( e2 \rightarrow r \quad (=s), e1 \)

Only in this way does the truly complex nature of the present perfect, compared to the non-perfect preterite, become clear. At the same time the inconsistency of Reichenbach’s two simultaneous points of orientation is removed and the natural condition taken into account that a point of orientation exists only because of its function as a definition of an event. The lack of past points of orientation implied by this description and, correspondingly, the
At this stage it should already be evident that the cognitive-semantic structure postulated here for the present perfect implies not only complexity but diversity as well. In revising Reichenbach’s tense theory, we reach a point where the present perfect and its complexity can no longer be accounted for in terms of tense alone. The relation between the present structure and the ‘past’ structure will turn out not to be one between tenses but between a tense structure and the taxis feature of anteriority (ANT), realized here by an event in the past only as a consequence of its application to a present tense structure:

(9.4d) The Present Perfect As Tense and Taxis: ANTe2 – r (=s), e1

Consequently, applied to a future tense structure (in the case of the future perfect), this taxis feature will appear not as the ‘past’ of the future, at least not in the former sense of past (i.e., as previous to the moment of speech), but, more appropriately, as anteriority in the future (see further below). A metaphorical use of the notion ‘past’ in this case would obscure the crucial distinction to the effect that tense relations depend directly on the moment of speech, whereas taxis relations do not. Before we can formalize the future perfect, we must first turn to the past perfect and its relations to the present perfect.

The obvious dilemma, observed but not really explained by McCawley (1971: 103–104; for a criticism, see McCoard 1978: 186–190), arising from the traditional tense-based hypothesis of parallelism between the present perfect and the past perfect, can in fact be solved only by applying the concept of taxis. Such a parallelism is evidently inadequate because if the past perfect is understood as ‘the past of the past’, what then is the present perfect? Is it ‘the past of the present’, or, perhaps, ‘the present of the past’? Both suggestions must be rejected, since there can (in terms of tense) be no past in the present; nor can there be any present in the past. The only true parallelism between the present perfect and the past perfect pertains to taxis, more specifically, to the invariant feature of anteriority, operating in the former case on a present tense structure, in the latter case on a past tense structure.

Aware of the inadequacy of a tense-based parallelism, Comrie (1985: 77–82) concludes, instead, that there obtains a systemically different status of the present perfect, on the one hand, and the past and future perfect, on the other, maintaining in the former case (without further foundation) his original (cf. Comrie 1976) ‘aspeccal’ analysis of the perfect, but in the latter resorting now to the traditional concept of ‘relative tenses’. The arguments adduced by Comrie for this differentiation do not invalidate the taxis solution suggested here; on the contrary, they refer mostly to conditions more
easily understandable precisely in conformity with this solution. This would hold, for example, for the crucial problem inherent in the basic incompatibility of the present perfect with definite temporal references and analyzed below on the basis of taxis.

Within the system of taxis features, anteriority is thus opposed not only to posteriority but also to the unambiguously non-tense (and non-aspect, for that matter) feature of simultaneity (see below). The adequacy of this hypothesis appears to be supported by the treatment of the German perfect in terms of “positional time” suggested by Žerebkov (1970: 64ff., 70ff., 177ff.) within a somewhat different theoretical framework.

The symbolic representation of the past perfect must therefore contain not one single past event, as in Reichenbach’s theory (a), but a past event and a second event anterior to it (b):

\[(9.5) \text{The Past Perfect} \]
\[ (9.5a) \quad e - r - s \]
\[ (9.5b) \quad \text{As Tense and Taxis: } (r3) \text{ ANTe2} - r2, e1 - r1 (= s) \]

According to the tense and taxis formula, we start from the primary point of orientation r1 (i.e., the moment of speech) and define first the tense feature of the actual state of relevance e1, viz., past time. Proceeding then from the secondary point of orientation r2, we define – besides the location of e1 on the time axis – the taxis feature of e2, viz. anteriority. The third point of orientation (r3) and, correspondingly, the location of ANTe2, may be lacking. This holds for those cases where the actual state, i.e., e1, although located on the time axis by r2, represents not a concrete-situational, but a generalized, relevance (of the anterior event ANTe2), in other words, where the state of relevance e1 is characterized by the aspectual feature of non-time-relatedness (see above). This meaning of the past perfect can be illustrated by the following example:

\[(9.6) \quad \text{She had sung that song long ago but didn’t remember the words any more.} \quad \text{Ona kogda-to davno } \text{pela} \text{ (IPF) } \text{ètu pesnju, no užè ne pominila slov.} \]

Compare now the different example:

\[(9.7) \quad \text{She had already sung that song when we arrived.} \quad \text{Ona užè } \text{spela} \text{ (PF) } \text{ètu pesnju, kogda my priechali.} \]

In the latter case the state of relevance e1 is characterized by the concrete-situational point of orientation r2 expressed by the subordinate clause when we arrived. In this case a precise location on the time-axis of the anterior event ANTe2 through r3 also becomes possible; cf.:
(9.8) She had sung that song half an hour before we arrived.
Ona spela (PF) ću pesnju za polčasa do našega prijezda.

If the actual state e1 does not represent the concrete-situational relevance illustrated above but is characterized by the generalized relevance of example (9.6), i.e., by the aspectual feature of non-time-relatedness, a definite location of ANTe2 and a corresponding point r3 are ruled out. This condition of aspectual predictability allows us – as already indicated – to postulate the hierarchically superordinate cognitive-semantic status of the actual state of relevance e1 in relation to the anterior event ANTe2. This hypothesis at least appears to give general support to previous treatments of the perfect in terms of embedding (for a critical discussion, see McCoard 1978: 165–204). A corresponding hierarchical view was expressed both in exclusively tense-based approaches such as, for example, McCawley's (1971: 104) analysis of the present perfect ("through deletions it acquires a derived constituent structure having a present as its highest verb and past as its next highest verb") and in Richard's (1982: 60, 91ff.) mixed tense-aspect treatment of this meaning ("a combination of present tense and perfective aspect").

We are now in a position to formalize the future perfect along the same lines:

(9.9) The Future Perfect As Tense and Taxis: r1 (= s) – ANTe2 (r3) – e1, r2

The present hypothesis of the hierarchical relation between the superordinate actual state of relevance e1 and the subordinate anterior event ANTe2 as a characteristic feature of the system of perfect meanings (which is in need of a more elaborate formalization than this has been possible within the above revision of Reichenbach’s symbolic language, viz., in terms of an adequate embedding of predicate structure; cf. Thelin 1988: 248ff.; see also Thelin 1990a: 71–74) appears to be of particular relevance for our understanding of the present perfect meaning. This property may in fact help us explain the notorious problem of the general incompatibility of the present perfect with definite temporal references indicated already above. Let us first have a look at the background of this problem.

The incompatibility of the present perfect with temporal specifications of its anterior event has been interpreted by linguists in different ways. Usually the systemic nature of this condition has been underestimated (see, however, Guenthner 1977: 96ff.; Smith 1978: 54–55), and examples have been adduced as ‘proofs’ of its inconsistency (cf. Andrejčin 1978: 199; Stankov 1969: 74; Andersson 1984: 203). However, such examples can usually be explained either as elliptic constructions (cf. Thelin 1978a: 47; Anderson 1982: 230) or as expressions of modal meanings like the assumptional, conclusional, or inferential. The latter operate in such cases on the perceptually available actual state of relevance e1 and make possible a temporal defini-
tion of the subordinate anterior event ANTe2, namely as a hypothesis about what must have taken place when in the past. Swedish, for example, can in these cases use, along with the unmarked preterite, the present perfect together with definite temporal adverbs to render such modal meanings explicitly, whereas English (at least British English) appears to be subject to a rather strict kind of disjunction, resulting, here also, in the general rule of incompatibility:

(9.10) *Apparently he has left town early this morning.
Av allt att döma har han lämnat stan tidigt i morse.

According to my informants, English in such cases prefers expressions like He seems to have... / He must have..., or else the unmarked simple past. From Michael Shapiro (p.c.) I have learned that constructions like 9.10 have become typical of contemporary American English.

The specific modal use of the present perfect discussed here is structurally akin to the basic present perfect meaning through the hierarchical superordination of the actual state of relevance e1, represented here by available information, clues, evidence, and so forth. Therefore, it is not really surprising that, for example, the paradigm of the inferential mood in Bulgarian is genetically close to the perfect (which holds for Turkish as well; cf. Slobin and Aksu 1982) and freely permits definite temporal references. The expression of such modal meanings by forms of the present perfect is simply another example of polysemy, just as would be, to a still greater extent, the corresponding use of the preterite.

In cases where the context does not imply such modal meanings and ellipsis is excluded, the use of definite temporal adverbs with, for example, the Swedish present perfect must be considered ungrammatical, too; cf.:

(9.11) *Peter has arrived yesterday.
*Peter har anlänt igår.

How then can we, within the theoretical framework sketched here, explain why the basic, non-modal present perfect meaning normally does not permit definite temporal references? I propose that the decisive reason for this condition is that there is in the present perfect a unique coincidence of the hierarchically superordinate actual state e1 with the primary, and, in the present, exclusive point of orientation, i.e., the moment of speech. Emphasized through this coincidence, the present relevance of the actual state e1 receives such an absolute cognitive-semantic predominance that it simply blocks a temporal specification of the subordinate anterior event ANTe2.

This explanation is related to and supported by the fact that a similar opposition between the present and the past, or the present and the future, does not arise in the past perfect or future perfect, because the taxis relation of
anteriority here exclusively concerns the past or future and does not directly involve the present. In these cases, too, the actual state e1, obviously, maintains the hierarchically superordinate status of the past or future structure in relation to the anterior event ANTe2 but does not cause any competition between two distinctive temporal meanings and therefore does not block specific points of orientation with the anterior events.

Summary

Summarizing the preceding analysis, we may assume the complex tense-taxis nature of the perfect, the hierarchical superordination of its tense structure of actual relevance, and the systemic independence of its subordinate, invariant taxis structure of anteriority, compatible with all tense meanings and all aspect meanings.

Generalizing further the theoretical implications of the observations made, we may also assume that taxis, represented here by the perfect taxis of anteriority, on a par with aspect and tense, belongs to the cross-linguistic grammatical categories of temporal meanings and deserves further attention in a functional grammar based on cognitive processing, not only with respect to those languages where it is represented by differentiated paradigms like, for example, English, Bulgarian and Swedish, but also to such languages where it is mainly expressed by polysemous verb forms and/or other non-verbal linguistic means, like, for example, Russian.

Under these conditions, the categories of aspect, tense, and taxis are understood as systemically independent but hierarchically interrelated components of predicational structure.

The category of tense is subordinate to the category of aspect because of its dependence on the aspactual opposition between time-relatedness and non-time-relatedness. In cases of non-time-relatedness, certain degrees of abstraction consequently do not permit any tense differentiation (cf. Thelin 1978a: 30ff.; 1984b: 227; 1985: 175ff.).

The incompatibility with the present of the time-related total aspactual meaning (+TOTALITY), expressed by Slavic perfective forms and English simple forms, does not imply any dependence of the aspect category on the tense category since this incompatibility is not connected with the system of tense oppositions proper but can be explained by the pragmatic condition that an event, perceived and reported at the moment of speech, cannot as a rule be subject to a total survey but only to a partial, or phasal, analysis (cf. Thelin 1978a: 33; 1984b: 231; 1985: 181ff.). As already observed, this is the reason why English simple forms in the present can normally only express non-time-relatedness. Time-relatedness (and totality) is possible here only in cases of temporal transposition (cf. Thelin 1982), i.e., where the past is re-
ported as present (the 'historical' present) or where the present is reported as (becoming) past (the 'reportative' and 'performative' present). Such transposition in the latter case implies segmentation of current courses of events as a precondition for their being presented as passing in sequence (rather than "viewing a past [...] event as if it were temporally immediate to G [= 'ground', i.e., "the position of the speaker and the speech situation"]; Langacker 1982: 284, 290ff.).

The category of taxis is subordinate to the category of tense, since its features, for example, anteriority, can operate only on tense features already established.

In addition to the aspect features of time-relatedness vs. non-time-relatedness (a distinction explicated further in terms of change-of-state conditions and foreground-background functions) and +/-TOTALITY, as well as the tense features +/-PAST and +/-FUT, I therefore suggest that there be introduced the corresponding taxis features +/-ANT and +/-POST (i.e., *posteriority*). The basic, and cross-linguistic, cognitive-semantic features of temporal meanings as evidenced by the languages under consideration could thus be summarized by the following survey:

\[
\begin{array}{ccc}
\text{Aspect} & \text{Tense} & \text{Taxis} \\
+/-\text{time-relatedness} & +/-\text{PAST} & +/-\text{ANT} \\
+/-\text{TOTALITY} & +/-\text{FUT} & +/-\text{POST} \\
\end{array}
\]

The combination of the features +ANT and –POST represents the taxis meaning of anteriority; the combination of the features –ANT and +POST represents the taxis meaning of posteriority (not actualized here but expressed, for example, by the Bulgarian or French 'past future'). The combination of the features –ANT and –POST represents the meaning of simultaneity, expressed for example by the so-called 'comitative Aktionsart' in Russian (cf. Thelin 1978a: 77).

By introducing the instrument of taxis in the linguistic description of time (in the broader cognitive-semantic sense of temporal perspective), we are in a position to isolate more accurately than was previously possible the tense meanings proper (+PAST, –FUT = past; –PAST, +FUT = future: –PAST, –FUT = the unmarked present) as a system of oppositions, defining, on the basis of the moment of speech, hierarchically independent events, whereas the taxis meanings define the relation of order of dependent events. The dependence of taxis structures on tense structures is, therefore, a mediate hierarchical dependence. For an earlier, direct moment-of-speech-based, i.e., tense-defining, use of the notions of 'anteriority' and 'posteriority', see Smith 1978: 44–46, 53–55; Thelin 1978a: 37ff.
In conclusion, answering the question raised in the title of this chapter, I would propose that from a cross-linguistic, cognitive-semantic point of view the perfect system of necessity involves all three temporal meaning categories: aspect, tense, and taxis. The invariant perfect meaning itself, i.e., the feature of anteriority, pertains, however, only to taxis. Under these conditions, to consider the combination of tense and taxis as simply a terminological variant of traditional ‘relative tenses’ would not be correct. The taxis concept, as applied here to the perfect meaning, implies not only a definite (i.e., subordinate) hierarchical relation to tense meanings (never expressed by ‘relative tenses’) but represents through this relation and connected with it, through its independence of the moment of speech, a specific temporal-semantic component distinct from the tense category. If the meanings of anteriority and posteriority (at least in a metaphorically expanded usage) might perhaps still be associated with the moment-of-speech-based tense distinctions, the related, clearly non-tense meaning of simultaneity (–ANT, –POST), overtly relating distinct events to each other (cf. Jakobson’s definition of taxis above), ultimately reveals that in reality we are concerned here with temporal distinctions not analyzable in terms of ‘tenses’ (‘relative’ or ‘embedded’), but requiring rather an independent grammatical status, viz., as pertaining to the category of taxis.
The presentation below may to some extent be understood as a sample application of the philosophical, methodological, and theoretical framework for temporal studies proposed above. The example that I have chosen from German, considered by tradition to be a ‘non-aspect language’, can be shown to be equivalent in its semantic essence to the cross-linguistic (in their cognitive basis, presumably universal) aspectual distinctions expressed systematically, for example, by the Slavic languages. I am referring to the distinctive use of temporal conjunctions, represented most prominently by the notorious als-wenn opposition. The existence of an aspectual differentiation in the use of these two conjunctions was to my knowledge never observed by traditional aspectology. However, it can easily be established that when translating, for example, Russian kogda ‘when’ into German one would fail to choose the proper one of the two conjunctions unless this choice were based on a situational-perspectival analysis, including fundamental aspectual distinctions, and – on a subordinate level – meanings of tense.

While working on this problem it turned out that a consistent analysis of the traditional als-wenn opposition would in fact require an analysis of a third temporal conjunction, viz., während. It became indeed an indispensable task to relate this conjunction in cognitively coherent ways to the basic opposition als-wenn within an overall model of aspect and tense distinctions (see Figure 7 at the end of this chapter; since organized not in the order of presentation but according to their derivative location in this model, the examples are appended at the end of this chapter together with the figures).

The introduction of this third conjunction does not question the systemic primacy of the als-wenn distinction – a view shared also by Hansjakob Seiler (personal communication). The temporal conjunction während takes, as we shall see, a peripheral, highly marked, position in the overall system. As demonstrated below, it owes this position to its complex underlying semantico-syntactic structure. As distinguished from als-wenn, it implies not only an obligatory assignment of the identical aspectual analysis to both the subordinate and the main clause, including the simultaneity of their events, but it also performs this analysis in a particular way, viz., by embedding – by way
of contextual delimitation, i.e., totalization – continuous activities (or states) in the foreground. The latter, seemingly anomalous, procedure (combining continuous activity and totality) would probably have made any aspectologist despair had it not been for previous observations of its underlying semantico-syntactic in Slavic narrative texts. The first awareness of this phenomenon goes back to an analysis of Puškin’s *Vystrel* (‘The Shot’) in Thelin (1984a: 266, 284; cf. also 1990a: 27, 30, 34, 60). For a detailed analysis, see further below.

After these preliminary remarks let us proceed to the question of accounting theoretically for the knowledge speakers of German must possess about events and their situational context in order to choose the proper temporal conjunction. Such knowledge, while collective in its socio-cultural and cognitive-linguistic basis, is assumed in a decisive way to include the point of view of the speaker, viz., as the outcome of previous and actual individual experience, emotions, values, interests and expectations, needs, preferences, and so forth.

The fundamental claim of the model presented below (see Figure 7) is that events, on the basis of such knowledge (in a broad sense), are analysed according to the two situational-perspectival oppositions +/-FOREGROUND and, in the case of –FOREGROUND, according to +/-CLOSE BACKGROUND. Negatively specified close background represents various kinds of what I have called *remote background*. This distinctive system of aspectual analysis (to be explicated further below) has traditionally been referred to as “grounding” (see 3.8). The latter concept is treated here in *a restrictedly temporal sense*, although, it may, as pointed out by Seiler (p.c.), certainly imply besides temporality (concomitant) meanings of modality, manner, and locality. The traditional foreground-background opposition was elaborated further in Thelin (1984a: 266; cf. 1990a: passim) by the unpacking of the concept of ‘background’ into ‘actual background’ and ‘proper background’. As indicated above, I have since replaced these concepts by close background and remote background, respectively (cf. Thelin 2002: 23ff., 47ff.). This suggestion has been confirmed by further empirical evidence presented in Seiler’s (2004: 190) study of linguistic polarity. Among the techniques of cognitive-semantic polarity postulated by him, the feature ‘distanziert’ (and its implied distinctions) quite naturally encompasses the situational-aspectual oppositions suggested here.

According to the present analysis, the two situational-aspectual oppositions +/-–FOREGROUND and +/-–CLOSE BACKGROUND, together with the subordinate tense opposition +/-–PAST, make up the core of the temporal distinctions underlying the choice between *als* and *wenn*. The prerequisites for choosing the third alternative – *während* – are represented further, as we can see, by a semantico-syntactically complex specification of the foreground feature. This specification, circumscribed here in a rather ad hoc way in order to give an idea of the implied complexity, deviates from the rest of
the system, which is based on immediate aspectual references to individual events (irrespective of their appearance in the main or subordinate clause), viz., by their total, i.e., event-delimiting, plot-advancing view in the foreground, and their partial, i.e., in-process, view of ongoing events in the close background, respectively. Während, however (as demonstrated by Examples 10.4a–c; see the end of this chapter), foresees not only the embedding of activities (or states) in the foreground by their mediate, contextual totalization, but it also assigns this same perspective on events to both the main and subordinate clauses, including their simultaneity. This locates während at the periphery of the overall temporal system and assigns to this conjunction the highest degree of relative markedness.

The notion of 'relative markedness' is based on the theory of additive markedness suggested in Thelin (1987: 107ff.). It seizes upon the accumulation of the quantity of positive feature specifications through the tree of derivation and the corresponding increase of markedness from the right to the left on the final level of realization. For a simple but instructive example of this principle, see the derivation of the semantico-syntactically and – in a corresponding way – morphologically differentiated numeral "five" in Bosnian/Croatian/Serbian (Figure 8 at the end of this chapter). Here petorica ‘five persons’ is shown formally to be the most marked form of the three. This straightforward principle of relative markedness still seems to be a realistic way out of the dilemma of absolute markedness characterizing most traditional approaches.

In agreement with this theory of markedness we are in a position to establish that the least marked of the three alternatives is the conjunction wenn (see Figure 7), chosen for events analyzed not as part of the situational foreground, i.e., not as plot-advancing changes-of-states, nor for ongoing events simultaneous with them in the close background, but for events referred to as remote background information. The concept of remote background, I suggest, includes not only habitual (and, occasionally, backgrounded iterative) events but also simply denoted events, i.e., those referred to in traditional Slavic aspectology as representing konstatacija fakta 'statements of fact’. This distinction is reflected to a certain extent by the proposal by Zifonun et al. (1997: 2282ff.) who speak of ‘generalizing temporal use’ in the first case and of ‘factual use’ in the second. For an example of habituality compatible with all three basic tenses, see 10.1a (in the list of examples at the end of this chapter). In agreement with the restricted attention here to temporal meaning, of which the reader is reminded, the intended reading of the main clause in the future time example of 10.1a. is temporal, not modal. A simple denotative reference to events, representing remote background information rather than plot line changes, is illustrated by Example 10.1b. A particular case of simple denotation, realized by temporal subordinate clauses, is the performative reference to events by means of wenn, that is, when events are spoken of simultaneously with their being accomplished (see Ex-
ample 10.1c). The visibility of the action itself logically makes its temporal marking superfluous. For obvious reasons this use is compatible only with present tense.

In the opposite cases of foreground and close background (see Figure 7), the choice of conjunction depends on the assignment of tense. For future time the conjunction is *wenn*, for past time *als*. For an illustration of the future use of *wenn* for close background and foreground, see Examples 10.2a and 10.2b, respectively. For the past use of *als* for close background and foreground, see 10.3a and 10.3b, respectively. The corresponding historical present use is illustrated by 10.3c and 10.3d. It should be noted that the tense distinction +/-PAST (see Figure 7), more specifically –PAST, does not include present time here since, due to its restricted viewpoint in the moment of speech, it is irreconcilable not only with foreground totality but also with close background partiality, the latter being by definition correlated with the former; that is, the meaning of simultaneous process in the close background presupposes a partial aspectual reference to this event by means of an event situated in the foreground by a total aspectual reference (see Example 10.3a). Historical present (see 10.3c, d) is only an apparent exception that can be ruled out by treating the historical present as transposed past. This view, suggested in previous work (Thelin 1982, 1985: 189; 1990a: 34; see above, Section 8.2.3), is also adopted in the present model. There are, of course, the normal cases of ongoing (partially viewed) events simultaneous with the moment of speech, but these do not represent close background but rather the present foreground embedding of these events between past and future changes-of-state (see 3.12, Example 3.3 in Section 3.12).

The notion of partial aspectual reference to events, or partiality (–TOTALITY), suggested in Thelin (1978a: 31ff.) as an equipollent counterpart of traditional totality (+TOTALITY), a distinction merely indicated in Figure 7, belongs to the level of aspectual perspective on events, hierarchically subordinate to, and thus dependent on, the level of aspectual perspective on situations, i.e., the situational perspective or ‘grounding’ focused upon in this presentation (see 2.1, 3.12, 4.8, 5.6, 8.6).

Besides the notion of ‘distanziert’ referred to above, Seiler’s work on a system of polarity techniques (2004: 190) provides the feature ‘lokalisiert’ (‘localized’) that neatly covers the cognitive semantics of the aspectual totality-partiality distinction as well. This notion reflects not only the way these aspectual instruments operate on events (by totalizing and partializing them, respectively), but also the distinction between, on the one hand, the corresponding location of such events in the aspectually-temporally defined foreground and close background (except for actual present; see above), respectively, and the absence of such location of events when referred to the aspectually-temporally undefined remote background, on the other.

The structural closeness of future *wenn* and remote background *wenn* exhibited by the present model of derivation fairly well matches not only their
homonymy but also the hypothetical origin of the future tense meaning in modal meanings closely related to the temporal meanings of the remote background. This condition is particularly evident from the conditional meaning of wenn, omitted from my restrictedly temporal description but, no doubt, often concomitant with the future time meaning. This hypothesis is not disqualified by the well-founded assumption (cf. Zifonun et al. 1997: 2284) that wenn (conditional and temporal) historically originates in an interrogative temporal adverb since, according to this hypothesis, the specific future time meaning developed from modal meanings, including the conditional, viz., irrespective of the latter’s origin in a specific linguistic expression of time (cf. general temporal meaning > conditional meaning > specific temporal meaning, i.e., future tense).

If the close background can be said to typically represent an ongoing event related directly to a foreground event (see Examples 10.2a and 10.3a), the perspectival meaning expressed by German während is of a different aspectual nature (see Examples 10.4a–c). In the case of this conjunction there is no aspectual reference to a part (or phase) of the ongoing event simultaneous with a foreground event typical of the close background. On the contrary, in the case of während reference is made to the activity (or state) as a continuous whole, embedded in the foreground of the subordinate clause and parallel to the corresponding activity (state) of the main clause.

A comparison supportive of this situation (already foreshadowed) is offered by ongoing events in the genuine present of discourse (cf. What are you doing? – I’m making tea.). Since in the genuine present there can be no immediate relationship to any foreground event in the total aspectual perspective, such ongoing events cannot represent close background either; they constitute the foreground of hic et nunc. Ongoing events in this foreground of genuine present are, to be sure, also subject to the partial aspectual perspective (i.e., by reference to one of their phases), but in contrast to close background, partiality is defined here by the moment of speech. Similar to the während kind of totalization, such foreground events can be delimited only mediately, by the context, i.e., by potential changes-of-state in this foreground itself.

As already indicated, the interpretation above is based on earlier observations on Puškin’s prose, specifically the embedding of activities in the foreground by their contextual totalization (cf. Thelin 1984a: 266, 284ff.); see Example 10.5. Here we can see how the continuous activity expressed by imperfective otkazyval’sja ‘refused’ is contextually delimited by the state-changing total events expressed by the surrounding perfective forms stali ‘started’ and velel ‘commanded’. It is in full agreement with the meaning of delimited continuity underlying the present interpretation of während that this kind of foreground embedding assigns a definite effect of retardation to this section of the plot line.
Independent support for this interpretation is furnished by the corresponding description of während vs. als in DUDEN (1995: 766–768; in my translation). Example 10.4a, taken from this grammar, is commented upon as follows: "The content of the subordinate clause is paralleled in its temporal extension [my emphasis] with that of the main clause." The example Als er (gerade) schrieb, brachen sie auf (parallel to Example 10.3a), on the other hand, is explicated in the following way (my emphasis): "A temporally shorter event [...] is in a way embedded into a temporally longer one. It is a characteristic feature of the temporally longer event that the corresponding clause contains (or may contain) an expression that denotes a section of time, for example, gerade ['at this very moment']. The latter somehow lifts out from the temporally longer event the section of time within which the shorter event takes place." Despite the impressionistic nature of this grammatical description, there can be no doubt about its attempt to grasp, more or less intuitively, the aspectual conditions involved. This description thus not only underpins the suggested interpretation of the aspectual semantico-syntax of the conjunction während, but it also circumscribes the aspectual essence of close background process in the case of als, correlated with foreground totality, in terms that convincingly demonstrate its nature of correlative, equipollent partiality.

A question that now most naturally suggests itself is whether the present aspectual analysis of the conjunction während, i.e., as system-peripheral contextual totalization and embedding of syntactically parallelized events in the foreground, can be confirmed by the corresponding incompatibility of this conjunction with the temporal adverb gerade (Russian kak raz), viz., as its opposite expression of partial (phasal) aspectual reference to ongoing events and, according to DUDEN, typically combining with the conjunction als. This indeed seems to be the case. The use of gerade in während clauses (see below Examples 10.4a+ – 10.4c+) is experienced by my informants as problematic due to mutual exclusion (at least as the expression of temporal perspective; although in a commentative reading of gerade, Example 10.4a+, for example, would apparently be acceptable).

In cases of stative predicates, in the main clause (see 10.4b+) or in the subordinate während clause (see 10.6a and 10.6a+), the anomaly of inserting gerade as temporal determination appears to be particularly evident. The corresponding Russian translation (see 10.6b, 10.6b+) would thus not permit the insertion of kak raz either. However, in agreement with my interpretation, parallel to the delimited, i.e., totalized, state in the subordinate poka clause, we find a similarly delimited or totalized activity that can be shown to possess a corresponding, definite extension or continuity, represented by the activity predicate of the main clause, schodil. It is thus not by chance that we are concerned here with the perfective aspect form (schodil) of precisely the so-called two-way verb of motion chodit' (IPF). Schodit', exactly like German holen, here represents the totalized extended activity of 'going
somewhere, asking somebody there to come with you, and finally coming back with this somebody’. This activity is simultaneous with and parallel in its delimited continuity to the state of the subordinate während clause. This analysis explains why it would be problematic (given the temporal reading) to replace the two-way verb of motion in 10.6a and 10.6b; see 10.6a++ and 10.6b++. However, according to my informants, 10.6a++ would permit an adversative reading.

The occurrence of continuous activities and states subjected to a totalizing, delimiting aspectual perspective was one of the stumbling-blocks for traditional aspectology, in particular for those theories that defined ‘perfectivity’ in terms of ‘punctuality’ (cf., e.g., Dahl 1974: 30). Temporally confined, continuous activities like those expressed, for example, by the delimitative Aktionsart (cf. Russian pochodit’ ‘walk for a while’, pospat’ ‘sleep for a while’) could not be explained by these theories. Aspectual totality as explicated in Thelin (1978a: 33ff.) created conditions for a new understanding of this phenomenon not only in such cases of immediate totalization of events as demonstrated by the delimitative Aktionsart but also in the cases of mediate, contextual totalization discussed extensively in the present chapter. Without the possibility of reconciling totality and extension in time, frequent uses of the ‘aorist’ (‘perfective past’, ‘passé simple’) in, for example, Modern Greek, French (cf. Seiler 1969: 124) or Bulgarian (cf. Thelin 1978a: 57) would remain unexplainable.

Keeping in mind the analysis presented above, I consider it worthwhile to discuss briefly the well-known examples of temporal subordinate clauses in Modern Greek introduced in the aspectological discussion by Seiler (1952: 43; cf. also 1969: 123ff.) in his pioneering work L’aspect et le temps dans le verbe néo-grec (see Examples 10.7a–c and the corresponding translations into German, English and Russian). These examples do not manifest any distinctive aspectual content in the temporal conjunction (otan ‘when’), as this was demonstrated above for German, but, in my view, they cast a revealing light on the aspectual semantico-syntax of temporal clauses more generally, and do so in ways that apparently underpin the assumptions of the present model. If we overlook the thesis, brought forward by Henry and Renée Kahane (1954: 118) in their review of Seiler’s book, according to which it is the conjunction that predicts the aspectual meaning of the verb, and, accordingly, two different otan would have to be postulated, we may now focus on the Greek verb as the primary carrier of aspectual-perspectival distinctions. This is also the basic idea of Seiler’s presentation, as well as the subsequent analysis by Arne Klum (1959: 28ff.) that convincingly refutes the Kahane & Kahane’s thesis.

In the first example, 10.7a, according to the present analysis, the imperfective non-past form thelete (2 p. pl. of thelo ‘I want’), similar to the form of the verb of the main clause akuo (‘I listen’), clearly expresses the feature of remote background, viz., of habituality-iterativity. In the second example,
10.7b, the imperfective non-past form *thelete* might hypothetically be understood to express foreground as does the perfective non-past form of the main clause *akuso*. However, the question then arises why the verb of the temporal subordinate clause is imperfective rather than perfective (as in example 10.7c). This phenomenon, according to a preliminary hypothesis, might be seen as evidence of the main clause structure embedding the subordinate *otan* clause structure and thus determining its situational aspect, i.e., foreground, and for reasons of redundancy leaving the latter formally unexpressed. Such an interpretation would not be far-fetched in the light of Kiparsky’s (1968) convincing syntactic analysis of the historical present in Indo-European. Thanks to his analysis we know that this use of the present is apparently due to the same redundancy-restricting mechanism of *conjunction reduction* as evidenced by the so-called *injunctive*, for example, in Vedic Sanskrit and Homeric Greek. Accordingly, the injunctive represented unspecified forms of the verb in conjoined structures, alternating with forms explicitly expressing aspect, tense, and mood. The occurrence of such unspecified forms resulting from conjunction reduction might, in agreement with an earlier suggestion (cf. Thelin 1990b: 122) and with the present model, be understood as *simple denotation* of events already aspectually defined by the context (and therefore merely symbolized; see 5.5), more specifically by the superordinate semantico-syntactic structure of the main clause. That we would be concerned here with a general strategy, possibly universal in nature, can be demonstrated for various languages by frequent occurrences like the one we see in example 10.1a, where future time is left unspecified in the subordinate clause *wenn er kommt*, because the future meaning is determined by the predicate of the main clause.

It appears evident that syntactically, i.e., hierarchically motivated simple denotation in such cases of conjunction reduction has a striking cognitive affinity with the kind of simple denotation demonstrated above in performative cases of predication. So far, I consider the notion of remote background to be semantically closest to the meaning of simple denotation. In fact, we are concerned with the function of *merely symbolizing* events, without assigning them any *temporal index*, at least not in a situational-aspectual sense (Thelin 1994: 264; see also 5.5).

Returning to the examples in 10.7 (see below), it is well-known that the semantico-syntax established so far allows of a still further aspe ctual-perspectival distinction, which appears to be redundant in the light of the above preliminary hypothesis, viz., the formal specification of the perfective form in the subordinate clause of Ex. 10.7c. It is likely that the occupation of this empty spot in the system actually enables a cognitive-semantic differentiation that undermines redundancy restriction. Accordingly, Seiler (1969: 123) suggests that this use of the perfective in Modern Greek entails a difference in meaning in comparison to 10.7b. According to my informants, this would also be the case in the corresponding use of the perfective form in
Russian (see 10.7c+++). Here the content of the subordinate temporal clause, accordingly, is felt to be made more concrete, and the total perspective gives special relief to the act of volition that presupposes careful consideration before its realization at one specific future point of time. Under these circumstances, the more elaborate hypothesis would thus be that thelete in 10.7b no longer expresses simple denotation but remote background of habituality-iterativity instead, while being governed semantico-syntactically by the superordinate perfective form akuso of the main clause foreground (for the detailed specification, see the following paragraph), whereas thelisete in 10.7c nullifies the "reduced" meaning of simple denotation and, by foregrounding, aspectually equalizes the event of the subordinate clause with that of the main clause.

To account for Seiler's observation (cf. also his explicit translations of 10.7a–c into German), the above analysis would thus allow of a further hypothetical specification of temporal-perspectival distinctions implied (effect-ed) by the extended formal diversification evidenced: In 10.7a, within homogeneous remote background, habitual-iterative akuo, by virtue of semantico-syntactic superordination, assigns habituality-iterativity to thelete as well, more specifically, in the form of unlimited repeatability; in 10.7b, within heterogeneous foreground, akuso assigns foreground to thelete as well, not as a specific event but as one to be chosen from an indeterminate number of possible events in the semantico-syntactically subordinate remote background of habituality-iterativity (modality); in 10.7c, within homogeneous foreground, akuso is aspectually matched by semantico-syntactically subordinate thelisete and thus restricted in scope to one specific event.

Summary

The above attempt to apply the cognitive-pragmatic model of temporal-perspectival analysis to the German conjunctions als, wenn, während may be understood as demonstrating the cross-linguistic (in its cognitive basis, hypothetically universal) nature of aspectual distinctions and thus disqualifying the traditional, morpho-syntactically based idea of 'non-aspect languages'. Accordingly, it is hard to imagine a meaningful discussion of this kind of linguistic data without well-founded assumptions about their underlying cognitive and semantico-syntactic nature. Precisely this important insight inspired Seiler's (1969: 129, 133) early observations of (situational) aspect as a means of defining entire propositions, as well as their concatenation, accessible to an exhaustive description by way of its antecedent structure alone. Empirical evidence for this standpoint has been furnished above, particularly so in the case of the aspectual semantico-syntax of während. The close cooperation of aspect semantics with syntactic structures in temporal
conjunctions, reflecting complex situations of events including their concatenation, hierarchical ordering, and—in the case of während—parallel occurrence, to my mind, convincingly demonstrates that the predominant attention of traditional aspectology to morphological conditions—be it the preoccupation in Slavic for many years with “aspectual pairs” or the futile discussion whether adverbs (or conjunctions) aspectually determine verbs, or vice versa, has outlived its day. As pointed out by Seiler (1969: 124ff., 133), such matters turn out to be pseudo-problems in the light of coherent deep structure analyses (interpreted above in terms of hierarchical processing, including circular feedback).

The present analysis can be seen to explicate Seiler’s notion of the dimension of temporal grammar called grounding. More specifically, he would see his well-known idea of a cognitive-semantic continuum, inherent in this particular dimension, to be realized by successive transitions between foreground and background, thus locating my notions of foreground embedding and close background in the middle, adjacent to foreground and background, respectively (Seiler; personal communication). I take it that Seiler’s analysis gives complementary support to the present model from the point of view of superordinate grammatical systematicity, while presupposing, in effect, the particular perspective of actual cognitive processing reflected by the hierarchical model of encoding proposed here. Both perspectives appear to produce a more or less credible picture of the increase of relative markedness implied by the right-to-left progression within the continuum or the corresponding path of (positive) choices through the hierarchy of distinctions (cf. Figure 7 below).

In conclusion, I consider it necessary to point out the tentative and rather programmatic nature of these proposals. Still, it would be rewarding if they could serve as a point of departure for future attempts to broaden and review, in a critical spirit, their empirical scope on the basis of more comprehensive linguistic evidence, including extended contexts for disambiguation and a statistically reliable number of informants.
Figure 7. Aspectual Derivation of the German Temporal Conjunctions

Figure 8. The Principle of Additive Markedness Illustrated by the Bosnian/Croatian/Serbian Numeral "Five"

(ANIM=Animate, COLL=Collective, SEX REL=Sex Relevance, MALE PRES=Male Presence, EXCL MALE=Exclusively Male)
Examples

Jedes Mal, *wenn* er kommt, hat er Hunger.
[Habituality]

[Simple Denotation]

[Simple Denotation: Performative]

[Close Background, Future]

10.2b. *Wenn* er zurückkommt, brechen wir auf.
[Foreground, Future]

10.3a. *Als* er gerade ihr Photo betrachtete, klingelte das Telephon.
[Close Background, Past]

10.3b. *Als* er zurückkam, brachen wir auf.
[Foreground, Past]

10.3c. *Als* sie gerade das Brot aus dem Backofen holt, kommt er freudestrahldend in die Küche.
[Close Background, Hist. Present = Transp. Past]

10.3d. *Als* er dann zu ihr in die Küche kommt, laufen ihre Augen (Fallada).
[Foreground, Hist. Present = Transp. Past]

10.4a. *Während* er schrieb, gingen wir spazieren.
[Foreground Embedding, Past]

[Foreground Embedding, Pres]

10.4c. *Während* er schreibt, werden wir spazieren gehen.
[Foreground Embedding, Fut]

10.4a+ *Während* er gerade schrieb (= am Schreiben war), gingen wir spazieren.
10.4b+ *Während ich gerade diesen Brief schreibe (= dabei bin, diesen Brief zu schreiben), bin ich bereits weit weg von euch.

10.4c+ *Während er gerade schreibt (= am Schreiben sein wird), werden wir spazieren gehen.

10.5 […] posle obeda stali my ugovarivat’ chozjaina prometat’ nam bank. On dolgo otkazyvalja […] nakonec velel podat’ karty (A.S. Puškin, Vystrel). ’[…] after dinner we set about trying to persuade the landlord to play faro with us. He refused for a long time before finally ordering cards to be brought out.’

10.6a. Während ich bei dem Kranken blieb, holte er den Arzt.

10.6a+ *Während ich gerade bei dem Kranken blieb, holte er den Arzt.

10.6b. Poka ja ostavalsja s bol’nym, on schodil za vračom.

10.6b+ *Poka ja kak raz ostavalsja s bol’nym, on schodil za vračom.

10.6a++ *Während ich bei dem Kranken blieb, lief er davon.

10.6b++ *Poka ja ostavalsja s bol’nym, on ušel (za vračom).

10.7a. Tha (fut. particle) sas akuo (IPF non-past) otan (opote) thelete (IPF non-past).

10.7b. Tha sas akuso (PF non-past) otan thelete (IPF non-past).

10.7c. Tha sas akuso (PF non-past) otan thelisete (PF non-past).

10.7a+ Ich werde Ihnen immer zuhören, soofi Sie es wünschen.

10.7b+ Ich werde Ihnen zuhören, wann immer Sie es wünschen.

10.7c+ Ich werde Ihnen zuhören genau dann, wann Sie es wünschen.

10.7a++ I'll always listen to you, whenever you say.

10.7b++ I'll listen to you, whenever you say.

10.7c++ I'll listen to you; just say when.

10.7a+++ Ja vas budu slušat’ (IPF), kogda chotite (IPF).

10.7b+++ Ja vas poslušaju (PF), kogda chotite (IPF).

10.7c+++ Ja vas poslušaju (PF), kogda zachatite (PF).
11 Appendix: A discussion of method and theory in temporal research

11.1 Preliminaries

Before I proceed in Chapter 12 to the main arguments brought forward by the proposed framework for temporal analysis and the conclusions to be drawn from them for future research, I consider it appropriate – as a prominent, preparatory part of this task – to discuss a recent monograph on time of which I became aware only in a late stage of editing this volume. This is Vyvyan Evans’ *The Structure of Time: Language, Meaning and Temporal Cognition* (Evans 2004). Since I found this book remarkable in many ways, and an a posteriori integration of an assessment with my own presentation would not only be difficult but also hardly do justice to its richness of observations and ideas, I decided to react to it *in extenso* in this appended chapter. This decision is justified not only by the coinciding fields of research but, more importantly, by the way such an assessment forms a contrast to and brings out in fuller relief my own methodological and theoretical positions. In effect, I believe it offers the reader an opportunity to consider alternative directions for future studies of time, as well as the possible basis for their complementarity, and does so as a natural part of continuous scholarly discourse.

11.2 Evans’ lexical approach to the structure of time

First of all, it should be said that Evans’ study is an empirically solid and theoretically innovative approach that is likely to influence the future discussion of the essence of time in significant ways. It proceeds like my own work (Thelin 2002; see Ch. 3) from the embedding of our theoretical, linguistically based models in an evolutionary-biological understanding of embodied reality (Evans 2004: 9ff., 49). Accordingly, it pays attention not only to the cognition of time but also to its perceptual correlates (pp. 6, 13–32) and their neurological basis (p. 21ff.). In the latter regard it founds perception as a
precondition for time cognition on “temporal codes or rhythms”, which corresponds to the crucial role played in my framework (Thelin 2002: 12, 34–37, 47ff, 54–56; see 2.4, 3.3, 3.11, 3.13, 3.15) by the endogenous production of rhythmical stimuli. This phenomenon was discovered by von Holst as early as the thirties of the past century, emphasized by Lorenz as “the most significant discovery [of the developmental history of our field of research]”, and applied by Trevarthen (1990a) to the perception of visual space as a regular scanning rhythm.

Here the first signs of divergences in our theoretical understanding become apparent. As we shall see, these are in general predictable from our basically different methodological points of departure. Whereas my holistic model represents processuality based on coherence, hierarchy and circular feedback, implemented by perceptual-actional abduction, viz., as the regulative device for explicit processes of continuous induction-deduction (Thelin 2002: 4ff.; see above, 3.2), Evans’ understanding of ‘processing’ is still characterized by an analysis closer to pattern (structure) than to process, and, accordingly, closer to inductivity than to deductivity. This has to do, in my view, with his essentially lexical-semantic focus on temporal meanings (on the level of their realizations almost exclusively through the word time and propositions containing it) and the corresponding, mainly inductive procedure of singling out the various ‘senses’ (‘lexical concepts’) of time (pp.107–183), related hierarchically only in a restricted, network-based understanding (p. 120), but not processually. Evans’ predominant analytical method of concept elaboration (pp. 5, 70–72, 93ff., 192–194, 223–224), circumscribing temporal lexical concepts by means of non-temporal ones, is very productive but of restrictedly inductive significance. A certain degree of deductive-explanatory adequacy can under certain circumstances be said to inhere to his complex ‘cognitive models’ (see below, 11.2.17) postulated on a ”more generalized level of conceptual organisation relating sets of lexical concepts and their elaborations” (p. 223).

With all appreciation for this state of affairs as a natural, transitional stage of progress in the gradual construction of truly explanatory and predictive models, it appears appropriate to point out possible obstacles to such progress and the methodological and theoretical evidence already available that might help overcome them. For one thing, it remains unclear how to integrate Evans’ surface-related ‘cognitive models’ in a coherent process of linguistic encoding (and decoding, for that matter) and, more specifically, how to relate them consistently to processes of perception/action and situation analysis, including change-of-state and cause-effect. In order to explore these conditions more closely, I will have to consider further the cognitive essence of Evans’ Complex Moving Time Model, Complex Moving Ego Model, and Complex Temporal Sequence Model (pp. 211–236). It will also be necessary to examine in greater detail the role played by perception in his ‘phenomenology of time’ (pp. 14-32). Let me at the outset anticipate the fact
that the problematic and in some cases incongruous positions inherent in Evans’ very complex and highly ‘distributed’ model (pp. 82–83) can often be removed by reviewing them in a coherent hierarchical-processual model with prominent circular feedback functions. The possibility cannot be excluded that much of the complexity and ‘distributedness’ encountered (to the extent that it cannot be confirmed by neural correlates) is precisely a result of the lack of logical-processual consistency. Let us begin from the beginning, with perception.

11.2.1 Perception

One central idea that runs through Evans’ work and is inspired by phenomenology is his notion of ‘temporal experience’. Time pertains, according to him, “to different levels and kinds of experience” (p. 5). The question that arises is: is time indeed something that we experience in any deeper perceptual-cognitive sense, or is such experience something that we instead project onto primitive (unconscious) levels by way of superficial metaphor and/or lexical-semantic influence? According to Evans, endogenous rhythmization – in my view, preconditioning temporal analysis proper – is itself temporal. He accepts the corresponding notion of ”temporal code” (p. 21ff.) and assumes that perception as such ”may be fundamentally temporal in nature” since ”underpinned by temporal intervals (‘perceptual moments’)” (p. 23). This temporal understanding of biological rhythms is, I believe, a result of the same unconscious feedback projection of subsequent temporal analysis onto the preceding level of non-temporal, divisible continuity (as a biologically based prerequisite) that led such prominent philosophers as Peirce, James and Bergson astray (see above, 3.11, 3.16, 4.6.1).

It is understandable that we – especially in the light of the explicitly processual model where time cognition operates in constant circular feedback on divisible continuity, or rather on the events thereby made perceptually operable – may (con)fuse these two levels. However, by not bearing in mind this hierarchical-processual distinction we easily fall prey to infelicitous assumptions. Evans thus questions ”the view that the concept of time is derived from event perception and that cognitively temporal experience is less basic than sense-perceptory experience.” This way of formulating the problem becomes irrelevant when we assume that time cognition interacts in a hierarchical-processual feedback fashion with the perception (including sense-perceptory discrimination) of events. Accordingly, notions like ‘temporal awareness’ (p. 16), ‘temporal perception’ (p. 23), or ‘cognitive and other perceptual processes’ (p. 5), strictly speaking, become ambiguous. Time, in my view, is not experienced (perceived) in any straightforward sense (although I certainly have occasionally yielded to this metaphor myself), whereas events are – with the aid of time.
11.2.2 Space and motion

Having said this, I suggest we turn to the perceptual-cognitive essence of motion because what events are all about is motion (i.e., unless we are concerned, of course, with stative events which express rest; see above, 3.13, 4.6.1). In agreement with the discussion so far it would appear symptomatic and not really surprising that Evans focuses on motion not as inherent in events but in its surface-related metaphorical application to time, on the one hand, and to the perceiving-cognizing subject, on the other, viz., as Moving Time and Moving Ego, respectively (pp. 60–77). The attentive reader will remember that these two derivative images were made more or less responsible for the failure of modern temporal logic (see 3.12, 4.4–5, Ch. 7).

Before I proceed further to Evans’ analysis, based on his partly critical assessment of Conceptual Metaphor Theory (CMT), it is indispensible to explore more closely what stand he takes in regard to motion since the latter is understood by most students of time to precondition time proper (and, more specifically, according to the present model, to represent a perceptual-cognitive construction based on a DEEP METAPHOR; see 3.16). Accordingly, this exploration also has to include space as the logical precondition for motion (treated as a perceptual-cognitive construction based on a DEEP METAPHOR as well). Generally speaking, I believe Evans is on the right track, but he tends to irresolution and non-transparency due to his predominantly static-hierarchical attitude (caused by his focus on lexical semantics), whereas a holistic-coherent view of hierarchical-processual interaction would apparently have facilitated his procedure. Consider the following quotation: "I will argue that sensory experience is processed by virtue of the perceptual mechanisms responsible for temporal awareness" (p. 16). If we in a constructive spirit interpret "sensory experience" as perception in a broad sense, "perceptual mechanisms" rather as cognitive operations, and "temporal awareness" as temporal analysis, then the picture becomes somewhat more transparent and the assumption that I also defend, viz., that time cognition hierarchically-processually partakes of event perception (in a feedback fashion), emerges naturally.

Now, what can be said, according to Evans, about the role of space and motion in the temporal analysis of events? First, in regard to space, he writes: "While evidence […] does strongly suggest that spatial concepts may, in part (or even largely), constitute our conceptions of temporality, from this does not follow that time is not also constituted by other kinds of (perhaps subjective) experiences. Nor does it follow from this that time is not itself directly experienced or perceived" (p. 15; my emphasis). After the above discussion it should be evident that "other kinds of experience” than spatial ones constitutive of time must refer to the various senses of time that Evans (pp. 107–183) infers inductively from his lexical-semantic analysis of temporal expressions, viz.: the Duration Sense, the Moment Sense, the In-
stance Sense, the Event Sense, the Matrix Sense, the Agentive Sense, the Measurement-system Sense, The Agentive Sense, and the Commodity Sense (see further below). There is no category of ‘spatial sense’ included, though. It is equally evident that it is to this level of analysis that Evans in the first place refers his conception of ‘direct experience or perception’ of time (as distinguished from the above view of time emergence as a basically unconscious perceptual-cognitive process of deep metaphorical-constructive nature starting from space and motion).

In another connection Evans develops his view by saying: ”While there is evidence from a number of modalities, including language, that at the conceptual level time is organised in terms of corporeal spatio-physical experience, this still fails to explain what is temporal beyond the spatial structure, and indeed, why temporal concepts should be elaborated in this way” (p. 8). The latter quotation still more clearly reveals that what is understood to pertain to “the conceptual level” here is (non-generalized) spatiality in surface-related circumscriptions (elaborations) of temporal expressions without deductive access to perceptual-cognitive hypotheses of deep structure spatiality (and temporality). The most urgent question is thus not to explain ”what is temporal beyond the spatial structure” but rather, conversely, what is spatial beyond the temporal structure, i.e., how we theoretically may conceive of the derivation of time from space and the motion of events (see above, 3.16, 8.3).

Of course, while we cannot consciously experience the processes underlying this derivation, we may (more or less) consciously circumscribe time on the lexical-semantic level such as we 'perceive’ it on the basis of event and situation structure already temporalized in image schemas, i.e., mainly in terms of space and motion. However, according to the present analysis, such circumscriptions in most cases represent superficial metaphors (see 3.16, 4.4, 4.6.4.2). It would, to answer Evans’ last question, appear reasonable to assume that the derivative spatio-motional nature of such circumscriptions of temporality points back – in indirect ways – to pretemporal spatiality (see above, 8.3). From where else would it come? Given the necessary deep structure hypotheses and machinery for hierarchical-processual feedback, one would – especially in view of the linguistic corpus Evans has brought together – indeed expect his lexical-semantic analysis (based mainly on elaborations) to contribute to future hypotheses that shed more light on these still poorly understood perceptual-cognitive and linguistic interrelations of spatiality and temporality. Herein I see, in a broader perspective, one instance of possible complementarity in our approaches. More generally, the exploration of the lexical-semantic level should naturally be viewed as a constitutive part of holistic-coherent models of time (see below, 11.2.18).

However, as matters stand now, Evans’ position in regard to motion remains non-transparent. He does not exclude that “temporal concepts are derived from experiences which are as basic as concepts derived from sen-
sorimotor experiences such as motion” (p. 33). He also argues “that temporal experience is neither illusory nor that it depends upon a prior conceptualisation (we do not have to first conceptualise time before we can experience it)” (p. 33). The ambiguity in regard to hierarchy inherent in these two statements demonstrates, in my view, the difficulties encountered by a model that abstains from advancing explicit hypotheses about the hierarchical process of derivation leading eventually to the level of ‘conceptualisation’ where Evans primarily locates ‘time perception’, viz., the level of lexical-semantic analysis of temporal expressions. How are we under these circumstances supposed to account for the dynamic interaction of cognitive and perceptual mechanisms in the temporal analysis of motion/events?

Further, on the one hand, Evans accepts evidence that “suggests that motion is perceptually both ubiquitous and salient, and thus forms a tight and ubiquitous correlation with ongoing temporal experience” (p. 202); on the other hand, he asks the question that ultimately reveals his methodological dilemma: “[W]hile our experience of motion correlates with our experience of time, is it necessarily the case that time correlates with motion?” This question illustrates the inevitable consequences of predominant inductivism, viz., in this case as irresolution in regard to the hierarchical-processual relations of two of the most central human concepts. More explicitly, Evans ends up drawing the remarkable conclusion that “After all, time is ongoing in the sense that we experience time whether or not we experience motion” (p. 201).

This position is surprising and, in my view, based on an illusion. According to the model presented above, time does not exist until we experience motion. Evans’ argument “For instance, breathing, which is ongoing […] presumably has a stronger claim as being more ubiquitously correlated with temporal experience than motion” (p. 202) overlooks the elementary fact that breathing too is motion, viz., body-internal physiological motion, to which we may (consciously or unconsciously) relate and which we, accordingly, may temporalize. To support the corresponding standpoint that “we actually experience the ‘passage’ of time whether there has been a change in the world-state or not” (p. 64) by references to experiments with situations of relative sensory-deprivation in windowless, sound-proofed cells, is not entirely convincing. Unless we are under an anaesthetic, we cannot in such situations avoid relating to body-internal motion (processes), i.e., possibly but not necessarily to breathing and heartbeat, more likely to physiological processes reflected by our getting hungry, thirsty, tired, and so forth, and most inevitably to the continuous processes of consciousness and thought, memories and imagination, connecting us, in turn, with the world outside the cell and thus having us relate also to its past and inferred present and future events.
11.2.3 Subjectivity, intersubjectivity, and perspective

Let me at this point briefly direct the reader’s attention to the fact that Evans in one of the foregoing quotations raises the question of possible subjectivity in ‘time experience’. This is an important observation that he also develops to some extent (pp. 16, 29–32, 35–37, 198). However, as distinguished from the thoroughgoing role of subjectivity and its interrelations with cognitive-linguistic intersubjectivity, more specifically as related to the crucial role of (temporal) perspective (cf. Thelin 1999: 248, 2002: 2, 6ff, 32ff., 41ff.; see also above Ch. 1 and Sections 3.1–2, 3.10, 3.12, 4.2), subjectivity in Evans’ theory, although paid due attention, cannot under the circumstances be integrated in any coherent way. It is noteworthy, however, that precisely in speaking of subjectivity he gives expression to the fertile idea that “temporality is a […] subjective experience, which […] can be plausibly traced to neurological states, processes and structures” (p. 31). Unfortunately, though, this idea cannot be said to govern in any decisive way Evans’ theoretical model, which might have been the case had he consistently followed the alternative account “[which] due to work by Grady, suggests that temporal processing […] may constitute one of the most basic aspects of our cognitive architecture. As such, it enters into many aspects of cognitive function and therefore operates at a level of cognitive processing which may not readily become accessible to focal consciousness” (p. 37; my emphasis).

We might still understand and realistically evaluate Evans’ model (in his own terms) as aiming ultimately at an “elaboration of temporal concepts in [according to Evans, intersubjective] terms of external sensory experience [that] serves to foreground otherwise backgrounded processes.” These processes are, as we have seen, not yet subjected to any systematic integration in Evans’ model of ‘temporal processing’. This condition also holds, as indicated, for the role of subjectivity itself (including emotionality) in so far as it (besides remarks about its general relevance for temporal experience) remains unrelated to the corresponding role of perspectival differentiation so decisive for the perception and cognition of things and events, and accordingly, for spatial as well as temporal analysis. Temporal perspective (‘time perspective’) is mentioned by Evans merely on two occasions (pp. 187ff., 196) in the margin of his treatment of the tenses. The linguistic category and, in my view, the expression par excellence of temporal perspective, the aspect category, is conspicuous by its almost total absence. Whether this means that aspectual meanings have been entirely neglected, as well, we shall see below. Let us first turn to the tenses (pp. 185–198).

11.2.4 Tense

The first thing that strikes the reader is, of course, the fact that to the linguistic tense category, which constituted the main and usually exclusive subject
of traditional philosophical (including logical) treatments of time, Evans dedicates 14 pages in all out of 254. On closer reflection, this fact derives naturally from his predominantly lexical-semantic outlook and main occupation with surface-related metaphorical elaborations (for the inclusion of tenses in his cognitive models, see Evans 2004: 211–226 and my discussion below, 11.2.17). This, in itself legitimate, choice disregards deliberately the empirically well-founded distinction between grammatical and lexical-semantic categories, as well as their specific interrelations. The traditionally gained insights into the grammatical functions of tense (and aspect, for that matter), developed further and applied processually in recent cognitive-pragmatic treatments of time within holistic-coherent models of linguistic encoding/decoding and underlying situation analysis, basically remain outside the scope of Evans’ approach. The following questions arise: Is it possible to arrive at equivalent insights into temporal grammar by approaching time cognition from the exclusively lexical-semantic side? Is it possible to develop further the existing insights without having confronted them explicitly with the hypotheses and findings of the lexical-semantic analysis, and thus warranted the basis for a certain commensurability and possible working complementarity? I would answer negatively in both cases. Evans’ discussion of grammar (pp. 22–24, 85–87, 94) restricts itself to finding criteria mainly for the semantic differentiation of time in terms of its various ‘senses’. However valuable this analysis is for the lexical semantics of the WORD time, it is unable to derive these senses from the perceptual-cognitive deep structures of temporal analysis of events. This condition pertains also to the tenses.

The point of departure for Evans’ analysis of tense (pp. 185–198) is, accordingly, his intention to “consider the lexical concepts symbolised by the forms present, past and future” in order to “be in a position to examine […] the two complex models to which these lexical concepts apply, namely the Moving Time and Moving Ego models of temporality” (pp. 185, 211–226). While the cognitive status of these models will be discussed further below (11.2.17), the “cognitive antecedents” derivable from the elaborations of the tenses indicate, according to Evans’ analysis, in all three cases, at least for English, a locational content in terms of the front-back distinction (an idea advanced, actually, by Jean-Marie Guyau already in 1890 as the hypothetical origin of time/tense; see above, 2.1). For a language like Aymara arguments are adduced for a corresponding visual content, in particular for the past and the future. This is an interesting discussion, especially against the background of the issue of the cross-linguistic (less likely, universal) cognitive properties of tense as compared to aspect (see above, 4.6.8). The question is to what extent such elaborations can penetrate to the perceptual-cognitive depth of tense distinctions without due consideration of grammatical functions. For one thing, how is this locational or visual content supposed to correlate with antecedent situation analysis and, more specifically, the analy-
sis of events in terms of change-of-state and cause-effect, by necessity involving aspectual-perspectival analysis?

Evans does not offer any answer to this crucial question of cognitive-linguistic functionality. Accordingly, is it not likely that these elaborations leave undisclosed deeper perceptual-cognitive distinctions involved in event analysis? Such analysis is not addressed by the lexical-semantic approach. It is thus symptomatic that Evans’ discussion of tense here does not involve the notion of ‘event’ at all (see, however, pp. 211–226, and below, 11.2.17). On one single occasion it does when he quotes another treatment of tense, namely in Mandarin (p. 197ff.), but the different views reported on the latter’s locational content turn out to be dependent not on tense but on the sequencing of events. This phenomenon is treated by Evans’ third complex model, the Complex Temporal Sequence Model that I am now going to comment upon briefly.

11.2.5 The Complex Temporal Sequence Model: tense and taxis

Notwithstanding the functional incoherence rendered predictable by his restrictedly lexical-semantic approach, this treatment is one of the most interesting achievements I see in Evans’ book (pp. 227–249). It includes in the general concept of temporality what was neglected in most traditional philosophical and linguistic treatments, viz., the meanings of temporal order between events. Evans is apparently unaware of the corresponding discussion of temporal taxis that has been developing, in particular in aspectological quarters, since the first remarks by Roman Jakobson in 1957 (see above, Ch. 9). Had he been, he would probably have realized how the temporal categories, including taxis, hang together with respect to their hierarchical-processual functionality. When he says that his Complex Temporal Sequence Model “does not serve to integrate concepts such as Present, Past and Future” (p. 236), this is a view that cannot be reconciled with my finding that tense is a prerequisite for taxis since hierarchically-processually operated upon by it. In other words, taxis presupposes tense and, indirectly, a corresponding speaker (observer) and moment of speech (observation) as well.

Tangible evidence of the consequences of such incoherence in the perceptual-cognitive working of temporal distinctions demonstrated by tense and taxis is furnished by Evans’ neglect of the meanings of the perfect (see above, Ch. 9). In order to strengthen his hypothesis that “it is the elaboration of temporally-framed events such as the Event Sense [see below] lexicalised by time, in terms of locational content, rather than the use of the Past/Future concepts, which are evident [in examples of event sequences]”, he adduces (p. 228ff.) with reference to Lakoff and Johnson the following examples (with Evans’ numbering):
In referring to his hypothesis, Evans now says that "this discovery enables us to account for a puzzling fact. Lakoff and Johnson (1980: 41) observed that on first inspection there appears to be a contradiction in expressions such as [these]". Evans' interpretation goes as follows: "The contradiction is that in (18.3) concepts relating to the 'future' are conceptualised as being ahead and concepts relating to our experience of the 'past', as behind, while in (18.4) the 'future' is being conceptualised as behind (i.e., following), and the past as being ahead (i.e., preceding). While Lakoff and Johnson correctly note that in (18.4) temporal events are being sequenced with respect to each other, rather than with respect to an experiencer, we can also now observe that the expressions in (18.4) do not relate to the concepts of Past and Future at all." To begin with, it is noteworthy that (18.3) b. is not, actually, an example of the past, but of the present perfect. Lakoff and Johnson are right, and so is Evans, as far as the events (to be inferred) in (18.4) are indeed "sequenced with respect to each other". However, Evans' conclusion from the second part, i.e., "rather than with respect to an experience", viz., to the effect that "we can also now observe that the expressions in (18.4) do not relate to the concepts of Past and Future at all [my emphasis]", is infelicitous. It overlooks the fact that sequencing (in the sense discussed here), i.e., taxis, operates by necessity on already established tense, and consequently presupposes an experiencer too (and a corresponding moment of speech / observation; see below), namely on the tense level (see above, Ch. 9). Under these conditions we are accordingly in a position to infer taxis, i.e., tense-taxis, not only in (18.4) but also in (18.3) b. In (18.4) the taxis features of POSTERIORITY and ANTERIORITY operate on PAST or FUT (the examples are ambiguous), viz., in (18.4) a. and (18.4) b., respectively. In (18.3) b. ANTERIORITY operates on PRES. Such essential conditions of grammatical functioning appear not to be discerned by the lexical-semantic account in terms of locational content alone.

When it comes to the moment of speech/observation just mentioned, this precondition for basically all propositions (even if sometimes apparently absent due to abstraction) it was entirely left out of consideration in physical treatments of time (if we leave aside the moving observer of relativity theory) and often neglected in temporal logic (see above, 3.12, 4.5). Evans' treatment of tense proceeds from the plausible assumption that "due to the existence of a cognitively instantiated mechanism, the perceptual moment [my emphasis], perceptual processing is enabled" (p. 186). Since event analysis is not considered explicitly, it becomes ambiguous, however, whether
the perceptual moment pertains (as indicated by Evans; see also p. 21ff.) to a phase of the continuity effected by rhythmization and applied, according to my interpretation, to (potential) event structure to make it analyzable, or to the moment of speech/observation, from the viewpoint of which the observer should be understood more properly to relate to a phase of that structure coinciding with (present), preceding (past) or succeeding (future) the moment of speech/observation. Evans appears to tacitly transfer by metaphor the former sense to include the latter sense, or rather, to represent the event structure analyzed at a definite moment of speech/observation, when he maintains that “the Past, I have suggested, is ultimately derived from perceptual moments held in memory.” As we shall see, however, it is important to distinguish clearly between the observer’s stable point of view represented by the moment of speech, on the one hand, and phases in the continuity of rhythmized (potential) event structure, on the other. Otherwise we will not properly understand the true perspectival nature of temporal analysis, viz., as a discontinuation of (potential) event structure made divisible and continuous by biological rhythmization, and as a consequence we will resort instead to surface-related metaphors of either moving time or moving observer (Ego) as presumably indicative of the very essence of time (see below, 11.2.17).

11.2.6 Aspect

The importance of making explicit the moment of speech, demonstrated above for the tense-taxis cooperation, can be shown to be equally relevant to the hierarchical-processual aspect-tense cooperation. A theory of time that, like Evans’, does not include aspect as the superordinate category of temporal perspective (on which tense and taxis are in turn dependent), cannot, for example, explain the notorious enigma of classical time philosophy presented by the non-measurability of the present (see above, 3.12, 4.2, 4.8, 8.2.3). This enigma has not primarily to do with properties of tense, nor with locational content (“pertaining to the experiencer’s immediate vicinity”; p. 196), but with aspect. The simple solution to this ‘eternal’ problem of time studies is that measurement of an event’s duration presupposes delimitation, namely by way of aspectual totalization, i.e., the aspectual perspective of totality, reconcilable with events in the past and the future, but not with events in the (actual) present (see above, 3.16, 8.2.4, 8.3–4). Here, it is the aspectual perspective of partiality alone that is perceptually-pragmatically conceivable for references to events since these coincide with the moment of speech (observation) merely in one of their phases; or, put otherwise, from the viewpoint of the moment of speech events are perceptually-pragmatically accessible merely in the one particular phase that coincides with it. This interpretation also explains why English simple forms as expressions of aspectual totality (and time-relatedness) cannot by definition appear in the
present, whereas they may appear as expressions of non-time-relatedness, such as habituality and genericity, not involving aspeccual totality. The only explainable exceptions are due to temporal transposition in cases of historical, reportative, and performative uses (see my presentation above, 3.12, 5.6, Ch. 9–10).

The observations made from the viewpoint of lexical-semantic analysis may still to some extent, although not systematically, involve aspectuality (even if not recognized as such). One instructive example is Evans’ original model of perceptual fields (pp. 189–192) in terms of various spaces distinguished by their relative distance from the observer and his/her body. These matters are discussed with tense, i.e., the present, as a point of departure but are of a more general relevance to temporal perspective, more specifically, to the conditions handled traditionally by the aspeccual distinction between foreground and background (Thelin 2002: 23ff.; see also above, 2.3, 3.8, 3.12, 8.4.6, 8.4.10.3).

11.2.7 Evans’ lexical concepts (senses) of time and their methodological background

We are now approaching the core of Evans’ theory of time. Proceeding from his and Andrea Tyler’s theory of word-meaning termed ‘principled polysemy’, Evans (2004: 79–104) applies the analytical method of elaboration to single out the various senses or lexical concepts of time. It is on this conceptual level, following phenomenological experience, that time, according to Evans, ”achieves its apotheosis” and ”reaches the intricacy and beauty attested by the lexical concepts and cognitive models for time uncovered in this book” (p. 254). Before we are in a position to assess these lexical concepts (senses) and their organization in superordinate complex cognitive models in greater detail, we will have to consider their methodological background.

As already indicated, Evans (pp. 57–77) takes as his point of departure the practice of CMT (Conceptual Metaphor Theory). On its basis he develops a revised version for his own metaphorical-elaborational analysis of temporality. One central conclusion that he draws from his analysis, and I believe rightly so, is that the concepts of Moving Time and Moving Ego ”may not constitute primary metaphors” but rather ”complex models of temporality” (pp. 76–77). However, the predominantly static-synchronic meaning of ”primary” suggested here has to be contrasted (see below) with its dynamic-synchronic, i.e., hierarchical-processual, and ontogenetic meanings, respectively. Evans draws also a second, not equally self-evident conclusion in view of the preceding discussion, namely that ”the most revealing level of linguistic analysis may lie at the level of the lexical concept, rather than at a more schematic level of conceptual organisation” (p. 77). This is in fact his
credo anticipating the general orientation of the rest of his book. Now, if the
"schematic level of conceptual organisation” is understood as oriented to-
ward a higher degree of deductive-explanatory adequacy, and I believe this
has been the reason for the unquestionable achievements made by CMT,
then it would appear inconsistent to choose now the opposite direction to-
ward the predominant inductivity of analysis on the lexical level of concep-
tual organization instead of deepening the analysis of CMT (as suggested by
Michael Haley and myself; see above, 4.4, 4.8).

11.2.8 Interrelations of duration and change

One of the problematic consequences of Evans’ choice (pp. 62–65, 76ff.) is
demonstrated by his rejection of CMT’s view of change as decisively consti-
tutive of temporal analysis, and his corresponding suggestion to ascribe this
role to duration (Evans’ most fundamental, ‘Sanctioning Sense’ of time; pp.
107–121) instead. The fact is, the concept of change, as distinguished from
duration, has no integrated place in Evans’ model (if we overlook its ques-
tionable application for the purpose of distinguishing two secondary senses,
the Matrix Sense and the Agentive Sense; see below, 11.2.15). He admits in
general terms the significance of time for establishing change (pp. 251, 253)
but apparently fails to see how time relates not only to change but to dura-
tion as well. Evidence thereof are his arguments according to which “there
are a number of reasons to suspect that it may be the experience of duration
(rather than an awareness of change) which gives rise to foundational con-
ceptions of temporality” (pp. 63–65). First, he says, “an ability to experience
duration is logically a prerequisite for an awareness of change, while an
awareness of change is not a prerequisite for experiencing duration.” Sec-
ond, he refers to the experience of time ‘passage’ irrespective of change,
rejected by me above as an illusion. Third, he adduces an argument that can
be rejected on the same grounds as the preceding one. Fourth, he refers, most
revealingly, to biological rhythmization, i.e., in its ‘temporal code’ inter-
pretation, and concludes: "Accordingly, the experience of duration may be a
more plausible antecedent for our concept of time than change."

These arguments are obviously founded on an insufficient awareness of
the perceptual-cognitive hierarchies in temporal analysis and the resulting
(con)fusion (already instantiated above) of primary, non-temporal continuity,
on the one hand, and secondary, temporal continuity, on the other. Biological
rhythmization represents, in the model proposed above, non-temporal contin-
uity not subject to ‘awareness’ or consciousness, whereas conscious experi-
ence of temporal continuity represents an abstraction by synthesis from al-
ready temporalized events (see above, 3.16). Evans’ ’experienced duration’
cannot, according to this understanding, refer to both kinds of continuity and
should thus be disqualified in its application to this distinction. I would even
suggest that the notion of duration is not germane to the second case either
but is reserved instead for processes involved in measuring already temporalized events. Again, by making events explicit we realize that the duration of events presupposes their measurement, and the measurement of events is inconceivable without the instrument of time, viz., in the form of aspect, more specifically, the total aspectual perspective delimiting their extension by fixing changes.

Aspect, as demonstrated above (3.9–10, 3.13), is thus a prerequisite for the discrimination of change. Both change and duration are, on this interpretation, dependent not only on non-temporal continuity but also on aspectual-temporal analysis. The obvious cognitive-pragmatic primacy of change (defended by CMT) as compared to duration (in its restricted and, ultimately, only defensible sense) is evident from its advanced role in the hierarchical feedback process of temporal analysis of events, situations, and cause-effect conditions.

Also from the survival perspective, duration, resulting from the measurement of the extension of events, is, accordingly, of subordinate significance in comparison to the temporal analysis engaged in the discrimination of change-of-state. We may, of course, imagine situations with a decisive signification ascribed to the duration of an event, but this would then normally be due to its potential to cause a change (like, for example, a continuous rain that threatens to spoil the crop). This view does not mean that duration may not be ascribed a more basic diachronic role, viz., in the human ontogeny of event perception and cognition of temporal analysis. In agreement with my hypothetical reconstruction (see above, 3.16, 8.2.4, 8.3–4), it may thus play an essential role in the emergence of aspectual distinctions (i.e., still in interaction with change-of-state analysis).

In this light it would not appear entirely justified to advance duration as the basic ‘Sanctioning Sense’, as Evans does (p. 121) in his synchronic system of various senses, viz., as ”the core or primary meaning associated with the lexeme time” (unless we must assume that the perceptual-cognitive semantics of time differs essentially on the two synchronic levels of temporality, i.e., in situation/event analysis and in lexical expressions, respectively). It should be noted in this connection that Evans makes the important distinction between a ’Sanctioning Sense’ and ”a historically earlier Origination Sense” (p. 104). He continues: ”The senses are organised with respect to a Sanctioning Sense which typically (although not inevitably) has parallels with the diachronically earliest sense.” With due caution in regard to the attributes ”historically earlier” and ”diachronically earliest”, which evidently refer to the ”earliest attested meaning” of a lexeme (p. 111) and not to any explicit hypothesis about the ontogeny of temporal analysis, we might still basically agree with Evans’ hypothesis of an ‘Origination Sense’ role played by duration, viz., precisely in ontogeny (and in cooperation with aspect) but not with the parallel hypothesis of a basic role ascribed to duration in the synchrony of temporal analysis by his ‘Sanctioning Sense’.

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11.2.9 Criteria for lexical-semantic analysis

So far, my discussion has, with certain significant excursions, centred on the orientational part I of Evans’ book. In part II, to which I now turn in greater detail, the author presents his analysis of the various senses of time, among which the primary ‘Sanctioning Duration Sense’ has already been discussed at some length above. Evans understands his undertaking as an investigation of "the lexical polysemy associated with time" (p. 93). His method of determining distinct senses is based on three criteria: the Meaning Criterion, the Concept Elaboration Criterion, and the Grammatical Criterion. According to the Meaning Criterion, a sense “must contain additional meaning not apparent in any other senses associated with time.” According to the Concept Elaboration Criterion, a putatively distinct sense (lexical concept) "will feature unique or highly distinct patterns of concept elaboration.” According to the Grammar Criterion, "a distinct lexical concept may manifest unique or highly distinct structural dependencies. That is, it may occur in unique grammatical constructions.” To count as a distinct sense "a particular instance of time […] must satisfy the Meaning Criterion and at least one other" (pp. 93–94).

11.2.10 The Sanctioning Duration Sense

Let us with these preliminaries have a closer look at the distinct senses/lexical concepts postulated in Part II of the book. If we return first to the primary Sanctioning Duration Sense, it turns out that Evans’ definition of duration here (p. 108ff.) differs from the sense of duration he previously identified with the underlying rhythmical continuity of the unlimited 'temporal code' (p. 64) discussed above. Now he suggests that duration is "the INTERVAL holding or extending between […] two boundary (beginning and ending) events.” The attentive reader will no doubt associate this definition with my explication of duration above as the outcome of measuring events (in a general sense) by way of delimitation and the corresponding total aspectual perspective. We must not overlook, however, that what Evans calls intervals are in fact also events, viz., either stative events or activities lasting for a definite amount of time (p. 110) between the events that, by way of change, cause them to begin or end, respectively (assuming generally a cause-effect relationship). Unless we state this explicitly, we may not realize that we are indeed dealing in the two cases with events subjected to different aspectual perspectives. The ‘boundary’ events are always viewed in the total aspectual perspective, whereas activities ‘lasting’ between them are always viewed in the partial aspectual perspective, viz., as a potential reference to any one of their phases (e.g., ‘She was swimming all this afternoon’). In contrast, stative events between two ‘boundary’ events do not allow of such ‘processual’ references since they lack the necessary phasal structure. They
can be referred to only indirectly, by means of surrounding events viewed in the total perspective, as well as simultaneous stative events or ongoing activities, i.e., in the latter case viewed in the partial perspective.

This renewed excursion into aspectology appears indispensable to disclose how it is possible to (con)fuse the proper sense of duration in temporalized events with the underlying rhythmic continuity preceding temporalization itself. Our understanding of this distinction is impossible without considering the role of aspect in situation analysis and, most importantly, in the discrimination of change-of-state (interacting with cause-effect). When Evans (pp. 62–65, 67ff.; see the preceding discussion) says that duration is a prerequisite to change, but change is not a prerequisite to duration, this statement obviously pertains only to pre-temporal continuity because duration proper, as we have seen, is, contrariwise, necessarily dependent on change in its role as a delimiter by means of aspectual totality, without which duration is inconceivable. As we have seen in my presentation above (3.8–3.10), the latter perceptual-cognitive instrument of temporal-perspectival analysis (discontinuation) partakes in decisive ways (by way of circular feedback) already of primary situation analysis with the precise purpose of discriminating those events in preperspectivized chaos, i.e., in the continuous but divisible current of potential events, which imply a change-of-state.

Accordingly, it is important to distinguish between the cognitive-pragmatic concept of SITUATIONAL FOREGROUND CHANGE, on the one hand, and the distinct kinds of CONTINUOUS CHANGE in processes (motion) experienced in the SITUATIONAL BACKGROUND, on the other. Continuous change may be concrete (see below) or abstract in nature. The abstract kind is represented by the secondary experience of continuity (continuous change) assumed above (3.16) to result from a synthesis of events already subjected to an individuating temporalization by discontinuation. This secondary experience must, judging by all the circumstances, be the explanation of Evans’ ambiguous conception of duration. Under these conditions its role as the ‘Sanctioning Sense’ on the lexical level is not reconcilable with its derivative role in the hypotheses of synchronic temporal processing suggested in this book.

It does not seem far-fetched to assume that the incoherence just established is a consequence of precisely the predominantly lexical approach to the concept of time, and, more specifically, the corresponding lack of a distinction between basic verb semantics, i.e., actionality semantics (cf. ‘Aktionsarten’), on the one hand, and temporal-perspectival, mainly aspectual, semantics, on the other. It should not escape the reader’s attention that all examples adduced by Evans to illustrate duration represent either states or activities, not accomplishments or achievements (to use Vendler’s terms; for a critical discussion of the verb-semantic approach to aspect, see Thelin 1990a: 5–18), unless, of course, reference is made to the boundary events (Evans 2004: 117, 119). This picture reminds one strongly of Verkuyl’s
(1972: passim; 1999: 16ff., 73ff.) attempt to capture, on the basis of verb semantics, the essence of aspect, with the equivalent opposition between a 'durative aspect' and a 'non-durative' or 'terminative aspect' as result.

Experience of duration is, as we saw, a secondary effect of aspec
tualization (delimitation) of states and activities, in the latter case in combination with aspec
tual partialization, i.e., by the potential reference to one or more phases of the delimited event. Reference to one specific phase of an event in cases of its coincidence with a foreground event in the total perspec
tive or with the moment of speech does not cause one to experience duration, at least not in the proper sense (of delimitation or 'closure'; cf. Timberlake 1982), but to experience an 'open' process, i.e., a concrete continuous change in the close background or embedded foreground (see above, 3.12–13, 4.2–3, 4.6.2, 4.8, 5.5, 8.2.5, 8.3.3, 8.4.4, Ch. 10). Hence my notion of 'processuality' as the typical meaning conveyed by aspec
tual partiality.

There is, naturally, a relationship of dependence between verb semantics and aspect semantics, but this is one of a hierarchical nature. Verb semantics generally reflects various kinds of situational structure, whereas aspect seman
tics reflects the temporal perspective on this structure. We have already seen that states, due to their lack of phases, do not allow of the partial perspec
tive and allow of the total perspective only in cases of delimited exten
dion (duration). Whereas activities and accomplishments may appear in verb phrases that allow of both perspectives, achievements ('conclusives') as a rule allow only of the total perspective. However, this relationship of de
pendence does not justify the amalgamation of the two distinct cognitive-
semantic functions on one identical level in the hierarchical system of tem
poral processing. States (like exist, last) cannot by definition have any goal (telos, terminus), nor can activities (cf. push a cart, swim for an hour); how
ever, accomplishments have a goal that may be achieved or not (swim a mile, draw a circle), whereas achievements have a goal that is necessarily achieved (recognize, reach). These conditions have nothing per se to do with temporal perspective, i.e., with aspect, but with the underlying situational structure and corresponding semantico-sy
ntactic distinctions often referred to in terms of telic vs. non-telic, terminative vs. non-terminative, conclusive, and so forth. The proper role of aspect, however, is illustrated by the way it determines, for example, whether accomplishments achieve their goal or are merely approaching it, viz., by the total and partial aspec
tual perspective, respectively. The final blow, however, to verb-semantic – in particular the so-called terminativity theories of aspect, which (con)fuse the two distinct cognitive-semantic levels – was the evidence brought forward mainly from the Slavic languages that 'perfectivity', i.e., the total perspective, could not be said to be identical with the achievement of a terminus (as usually main
tained) but could be perfectly well combined with states and activities – pre
cisely in its function of delimiting their extension (duration) as discussed above (cf. Thelin 1978a: 33ff., 57, 71, 82ff, 86, 91; 1985: 182; 1990a: 10,
11ff., 18; see above, 8.1, 8.4.3, Ch. 10). See also my discussion of Evans’ Matrix Sense below.

11.2.11 The Moment Sense

Let us now proceed to the next sense of time postulated by Evans, viz., the *Moment Sense*. Here “*time* prompts for a conceptualisation of a discrete or punctual point or moment without reference to its duration” (p. 123). If this condition satisfies Evans’ Meaning Criterion, the Concept Elaboration Criterion is satisfied by Evans’ analysis according to which the Moment Sense is “*elaborated solely in terms of deictic motion*” (p. 124). He develops the latter – at first glance somewhat fuzzy – notion by saying that such motion “*presupposes a particular deictic centre with respect to which the motion takes place*” and further that “*the deictic centre often appears to coincide with the starting or ending point of the motion.*” He adduces the following example as “*both illustrative and typical*”:

(8.1) a. The time for a decision has come/arrived/gone/passed.

Evans’ third criterion, the Grammatical Criterion, is satisfied by his view that the Duration Sense and the Moment Sense represent two distinct grammatical classes, viz., mass nouns and count nouns, respectively (p. 125).

Let us first have a closer look at the mass vs. count distinction since it has a history in temporal studies and may accordingly shed some light on the cognitive-semantic essence of Evans’ Duration and Moment Senses, respectively. It is a well-known fact that the mass-count distinction was applied by a number of linguists precisely to interpretations of aspect (for references and comments, see Thelin 1990a: 32, 41). The interesting point is that these treatments in one way or another associated count and mass terms not only with aspectual ‘events’ and ‘processes’, respectively, but also more directly with ‘total and partial functions’ involved in their corresponding aspectual differentiation. This is the first indication that what Evans treats as Duration Sense and Moment Sense might in reality be understood to constitute lexical-semantic representations of an underlying temporal, i.e., aspectual, perspective. The second indication already inheres in the Concept Elaboration Criterion. Accordingly, what sense does it make to speak of “*deictic motion*” or to say that “*motion […] presupposes a particular deictic centre with respect to which the motion takes place*”, if we do not make explicit that deixis comes from somewhere, i.e., from an observer, and expresses his/her perspective on events. It is, I admit, still a considerable step forward that Evans takes here by actualizing events, viz., in terms of motion, more explicitly.

The more decisive step toward a perspectival understanding of the two different senses would obviously clarify the fact in a more simple and straightforward way that we are concerned in both cases with the total aspec-
tual perspective, only for two different purposes: on the one hand, to delimit, by establishing two changes-of-state (beginning and ending), the extension of states and activities (the Duration Sense); and, on the other, to establish one change-of-state (the Moment Sense). In both cases the total perspective engages accomplishments (telics) or achievements (conclusives). The total aspectual interpretation of change-of-state is not really reflected by Evans' circular reasoning that "a temporal moment is temporally discontinuous" (p. 124), since discontinuity, as demonstrated above, would obviously apply to temporalization in general, including partialization. The total aspectual meaning has sometimes been referred to in the aspectological literature as indivisibility (see Thelin 1990a: 32). However, the punctuality understanding applied by Evans to the Moment Sense (but disqualified long ago by aspectologists as irreconcilable with the 'perfective', i.e., total, perspective) is in reality tautological. An aspectual reinterpretation of the Moment Sense would have to dismiss punctuality for the simple reason that events in the total perspective may not be punctual at all, without, therefore, necessarily being viewed as having a delimited extension (duration). The decisive meaning of the total aspectual perspective is to establish a change, not to locate this change at a "discrete" point 'in time' (although these two functions may combine). Take the Russian example: Oni razvelis' (PF) do ili posle vojny? 'Did they divorce before or after the war?' If 'punctual' is meant to refer to the quantity of time an event takes, where does one draw the borderline between 'punctual' events and temporally delimited events of various extension? The temporal adverbial 'by the time he was fourteen' (Evans' example (8.1) c.) does not convey any momentary or punctual sense either. The well-known narrative method of condensing courses of events by perspectival manipulation is not a function of any 'punctual perspective' but of the total aspectual perspective on events permitting their delimitation from each other (irrespective of duration) and their appearance as rapid changes succeeding each other in the plot line. See my discussion of the Matrix Sense below (11.2.14).

It is interesting that when Evans, on the basis of the historical lexicon, hypothesizes about the origin of the Moment Sense and wants to see it derived from the Duration Sense (as Sanctioning Sense), he does so in terms of embedded intervals and a reanalysis of them such that they are "subsumed by the greater interval [...] without reference to their duration" (p. 128). This is actually a parallel to my own interpretation of how the duration-indifferent total aspectual perspective may develop (ontogenetically) from the total perspective implied by delimitation of extension, i.e., duration (Thelin 1990b: 104, 106; see above, 8.4.1, 8.4.3).
11.2.12 The Instance Sense

Evans’ third sense, the *Instance Sense*, refers to meanings traditionally treated in terms of *iterativity*. The latter notion is actually to be preferred, as we shall see from the following discussion. Evans’ examples demonstrate that the iterative meaning can be explicit or implicit. The example used for further testing against his three criteria is

(9.1) a. Devine improved for the fourth time this winter when he reached 64.40 metres at a meeting in Melbourne

The Meaning Criterion is satisfied since, according to Evans, “*time* references a particular instance (i.e., occurrence) of an event or activity, rather than an interval or a moment” (p. 131). The second criterion cannot be satisfied, however: “A particularly noteworthy finding is that this particular lexical concept appears not to have conventional patterns of conceptual imagery (concept elaboration) associated with it” (p. 134). He wants to see this explained by “the semantics associated with this lexical concept: it relates to an entity which constitutes an *instance of something else* [my emphasis]” (p. 132, see also p. 134). This is, I believe, an infelicitous and potentially misleading way of restating the traditional insight that iterativity is basically repetition of more or less similar events (a view expressed later by Evans in a more straightforward way), and for that reason leaves little room for concept elaborations. If the ‘instance-of-something-else’ explanation, in a benevolent interpretation, might perhaps still work for (9.1) a, where three preceding events are implied, but explicit reference is made only to the fourth one, it would certainly not work for his example

(9.1) c. He did it 50 times in a row

where reference is made explicitly to all fifty events as a whole. What is more serious, however, is that for the same reason this example does not match Evans’ definition of the Instance Sense according to the decisive Meaning Criterion, viz. that “*time* references a particular instance […] of an event.” The Grammatical Criterion, finally, is satisfied since iteration typically implies countability but as distinguished from the Moment Sense allows of both ordinal and cardinal numbers (p. 132).

As this brief discussion shows, there is apparently more to the question of iterativity than this lexical-semantic approach indicates. What is in fact the temporal status of iterativity? Is it possible to understand its essence without considering perspectival functions, i.e., mainly aspect? I do not think so. Iterativity, as well as its interrelations with habituality, are questions still in need of further exploration. However, the present state of affairs already appears to facilitate at least a feasible working hypothesis. Evans’ two examples reveal that we have to include situation analysis in our considerations
of iterativity, more specifically in terms of the aspectual distinction between foreground and background, in order to understand its cognitive-semantic working. Whereas in (9.1) a the event referred to explicitly is localized in the foreground, the three preceding events are localized (implied) in the background. In (9.1.) c, however, the iterative event as a whole is located in the foreground (unless a context is added that indicates habitual embedding and background). In the former case we might speak of inter-situational iterativity and in the latter of intra-situational iterativity. In other words, we always have to ask ourselves: what function do repeated events fulfil in situational structure, as well as in corresponding discourse or narrative structure, according to the given perspective?

As we saw above (Section 4.8), the aspectual distinction between foreground and background may naturally apply to Danaher’s (1999) pertinent distinction between simple (‘actual’) iteratives and habitual iteratives, viz., as related to Peirce’s categories of Secondness and Thirdness, respectively (see also above, 4.7, 5.7). What Evans’ example (9.1) a convincingly shows, as I pointed to in Thelin (1990a: 77), is that we apparently need a further differentiation and refinement of the background concept, possibly including functions of focus, in order to account for subsidiary information of an intermediate nature, i.e., that does not belong in the remote background of habituality, nor in the close background of actually ongoing processes. Another possibility is, of course, to reject the foreground-background distinction altogether, but what would the alternative be (see above, 5.6)? In any case, the perspectival essence of situation and event analysis cannot, in my view, be thought away. Without it our perception and spatial-temporal analysis of reality is inconceivable.

11.2.13 The Event Sense

Evans’ fourth sense of time, the Event Sense, naturally, arouses some hesitation from the start, particularly in a reader who understands time to represent a perspective on events. Let us examine to what extent such a lexical concept really makes sense. As distinguished, according to the author, from the Moment Sense which “references a temporal point (within a particular temporal event-sequence), the Event Sense references an experiential point in an event-sequence” (p. 135). What this distinction amounts to is not quite transparent, but I shall make an attempt below to clarify the matter. He also says that “the linguistic evidence for an Event Sense relates to boundary events, which is to say events which constitute beginnings or endings.” His first example is

(10.1) a. The young woman’s time [= labour] approached
Accordingly, Evans’ interpretation is that “time prompts for a particular boundary event, namely the beginning of child-birth [...] The boundary constitutes the beginning or ending of an interval of duration, which is to say the onset or the offset. For instance, in (10.1) a it is actually the onset of labour which is being signalled by time” (p. 136).

It is understandable that in this use of the lexeme time a specific event by way of metaphor (metaphorical ellipsis) is experienced, viz., child-birth / labour, or in the rest of Evans’ examples, the final whistle of a soccer match, the event of death, the barman’s signalling the end of licensing hours, respectively. The question is, however, can this circumstance indeed be captured theoretically in the way Evans is suggesting? What if we change the aspectual perspective to: The young woman’s time was approaching? The sense of event is still there, but is there any “boundary event” in the sense of an achieved terminus or telos, i.e., the “onset of labour [...] signalled by time”? Apparently, not. The ‘experience’ of ‘onset’, or change, is obviously dependent on the aspectual perspective, viz., the total view tacitly expressed by Evans’ reading of this example but not in the partial (‘processual’) view of the alternative version. Furthermore, could not Evans’ example, depending on the situation, signal the ending of nine months of pregnancy, as well, possibly on equal terms with the simultaneous beginning of child-birth? The obvious inability of Evans’ definitions to encompass standard interpretations of situational structure, including temporal-perspectival, mainly aspectual, analysis, obscures not only his attempt to distinguish an Event Sense from a Moment Sense (as well as Duration Sense), but also, more generally, the analytical instruments applied by his underlying theory of word-meaning to the concept of time.

If we return briefly to the Moment Sense, from which Evans wants to distinguish the Event Sense, it is easy to show that a change reported, depending on the context and various cognitive-pragmatic conditions reflected essentially by the actional semantics, may imply here both the ending and the beginning of activities. In Evans’ example (of the Moment Sense)

(8.1) a. The time for a decision has arrived/come

the change may be understood to imply primarily the ending of the activities preparing for (leading to) a decision, viz., in virtue of the conclusive sense of the decision event. The resulting situation is neither focused upon nor specified. If we take an alternative example like The time for reflection has come, the change may, in virtue of the activity sense of the event, contrariwise, be understood to imply primarily the beginning of new activities, i.e., reflection. The latter is based on the experience gained from a preceding situation neither focused upon nor specified. These are examples illustrating, according to Evans, the Moment Sense where ”time [prompts] for a reading relating to [...] a discrete point” (p. 124; my emphasis). But is there then any essential
distinction between this sense and the Event Sense if the criteria of (achieved) ‘boundary’ and ‘beginning or ending’ can also be said to apply to the former sense?

Let us rephrase Evans’ example (10.1) a (see above) and say instead, using the perfect: *The young woman’s time for (moment of) child-birth has come* and compare it with (8.1) a. Even if we would allow of different interpretations in regard to the new situation, do these two examples motivate two different senses of time? Would not the picture have been different, if we knew what specifically the decision in (8.1) a was about? Similarly, if the context had specified the activities leading to a decision, understood then as the self-evident goal or result toward which these activities were pointing, would it not also have been possible to say elliptically: *The time has come*? Everyone involved in the activities or informed about them would understand the sense. Would the entire difference between the two senses then not boil down to whether ellipsis is exclusively context-dependent or metaphorized as well? Even this distinction would not do, however, because we can perfectly well say: *The woman’s time has come* and have in mind a dying old woman, which shows that metaphorized ellipsis is also dependent on the situation (context).

The theoretical dilemma caused by Evans’ lexical approach to the structure of time is highlighted by his analysis ending up in a discussion of *death* as ”an occurrence [i.e., a boundary event constituting ‘the beginning […] of an interval of duration” (p. 136); my explication] and the period following death, when the body decays” (p. 137). It is my conviction that it would be not only more comforting but, from a biological and cognitive-pragmatic standpoint, apparently also more appropriate to regard death primarily as the *end* of life, and possible beginnings from here on to be the outcome of potential focus, in specific contexts, on matters either of physiological chemistry or religious belief. This is not to say that context or situational structure should not be considered more generally. On the contrary. The crucial question (for our present discussion) is in which respects situation analysis can be said to interact with time, i.e., temporal perspective. Evans’ examples do not appear to make it credible that there is an interaction of that kind that justifies the postulation of an Event Sense as distinguished from a Moment Sense. In both cases the temporal structure is characterized by change-of-state, typically conveyed by the total aspectual perspective. Whether the change is understood to constitute a beginning or an ending is dependent *not* on the temporal perspective, which is always aspectual totality, but on additional cognitive-pragmatic factors implied by the specific situation and expressed by morphological, syntactic, and lexical means. This condition becomes evident if we realize that the conception of *change-of-state foresees by definition that change always implies both a state before the change and a (new) state after the change.*
More generally we should not forget that the choice of linguistic means for conveying the underlying situation analysis, including the temporal perspective applied, is to a great extent conventional, i.e., language-specific. If we know that, for example, aspect can be conveyed more or less explicitly by the linguistic means indicated above, it would appear natural that a restricted lexical approach to time most probably either neglects this temporal category or embraces it accidentally and unsystematically. That the latter consequence applies to Evans’ analysis was already indicated above by his corresponding narrow treatment of the tense category, and becomes increasingly evident according to the progression of this discussion.

We are now in a position to appreciate more easily Evans’ preliminary suggestion that the Moment Sense “references a temporal point (within a particular event sequence)”, whereas “the Event Sense references an experiential point in an event-sequence” (p. 135). He also says that “while […] the Moment Sense relates to a purely temporal event, i.e., an event defined purely in terms of its relation to a temporal sequence […], the Event Sense […] relates to a particular external occurrence, which is to say, something that happens” (p. 137). In other words, the distinction could be simplified as one between experiencing time as a discrete point ‘in time’, on the one hand, and an event that takes place ‘in time’, on the other. Evans’ conclusion is that the Moment Sense of time is time-internal, whereas the Event Sense of time is event-external, or put more drastically, that there is time that defines itself, and there is time that defines events. This consequence is either senseless or the outcome of an unconscious (con)fusion of different hierarchical levels of temporal processing (see above, 4.6.4–4.6.4.3). My paraphrase of Her time has come as Her time for (moment of) of child-birth has come demonstrates that both in this case and in Evans’ example (8.1) a (The time for a decision has arrived/come) it is a matter of predicating about the preceding state (in a broad sense, including activities; note the use of the perfect; see above, Ch. 9) that it has either undergone a change to a qualitatively new state (i.e., child-birth, labour), or (subject to modality) has to undergo a change by its cessation (i.e., through decision-making) and transition to a new state (left unspecified).

It is noteworthy that all examples adduced by Evans to demonstrate the Event Sense have their verbs in the simple past non-perfect forms. This is particularly remarkable in (10.1) a (The young woman’s time [= labour] approached). According to the aspect theory applied here, approached could convey either the time-related total aspectual perspective of the foreground or the non-time-related aspectual perspective of remote background. Without any further context it is difficult to tell which perspective is intended (see the discussion above, Ch. 7). However, the background perspective, for example, in the sense of simple denotation (‘simple statement’, ‘general-factual’ meaning; see above, 5.5, Ch. 9–10) would contradict Evans’ conception of the Event Sense as marking “the occurrence as distinct from background
experience” (p. 135). Equally, it appears unmotivated to imagine here, according to Evans’ reading, an event in the total aspectual perspective, i.e., as part of a number of successive events in the foreground (plot line). The occasional lack of an unambiguous situational (contextual) account appears to be another symptom of the predominantly lexical-semantic approach. One consequence thereof is that Evans, when he by way of exception a couple of times resorts, as it were, to aspectual notions, he does so without a deeper understanding of the systematic temporal-perspectival functions conveyed by them. As we have seen above, this concerns not only the concept of ‘background’ but also his reference to “the durative aspect associated with an interval” as distinguished from the “one aspect of the interval, namely the onset or offset” (p. 136ff.), viz., as characterizing – according to him – the Durative Sense and Event Sense, respectively. It would probably be more correct to evaluate the latter unsystematic use of aspectual notions as accidental and as expressions of the general meaning of ’view’ (without a theoretical, temporal-perspectival foundation) rather than indications of a tacit adherence to aspectual theories based on an opposition ‘durative vs. non-durative aspect’, as suggested, for example, by Verkuyl but rejected by the aspect theory underlying the present analysis.

11.2.14 The Matrix Sense

Having presented the four preceding senses of time, defined by Evans as Primary temporal concepts, he proceeds now to four further senses defined as Secondary temporal concepts (p. 141). This distinction is based on his understanding that the former constitute “phenomenologically foundational temporal lexical concepts closely associated with perceptual and cognitive abilities”, whereas the latter are “derived from socio-cultural imperatives” (p. 141). The first concept of the latter kind to be treated Evans calls the Matrix Sense. Here ”time prompts for an entity which is unbounded […] that is not constrained by the interval holding between individual events […] (recall […] the Durative Sense). [I]t indexes an entity which has an infinite elapse, and thus is conceived as subsuming all other events, the Matrix in terms of which experience is possible” (p. 141). Evans’ first example of the Matrix Sense is the well-known quotation of Isaac Newton:

(11.1) a. [T]ime, of itself, and from its own nature, flows equably without relation to anything external

This example is indicative in at least two respects. First, it demonstrates that Evans accepts the ‘container’ conception of time refuted above (3.12, 4.7–8) as irreconcilable with time as an instrument for perspectival discontinuation. This is actually another instance of Evans’ adherence to the idea of time existing independently of motion and change: “time is a manifold which
contains’ events, and is thus independent of events. As this manifold is simply in the world ‘out there’, the passage of time represents the event which subsumes all other events” (p. 142). Second, it demonstrates the (con)fusjon of primary non-temporal continuity (effected by biological rhythmization), on the one hand, and, on the other, the secondary temporal continuity achieved, hypothetically, under the influence of the subsequent synthesis of analyzed (discontinuous) events, as a result of the non-discernment of the preceding cognitive operations establishing motion and performing its temporal discontinuation. The outcome of this (con)fusjon is the superficial metaphor of ‘moving time’ (my Metaphor III; see 3.16) ascribing to time the properties of motion, extension, divisibility, and continuity. This (con)fusjon, to which we all fall prey as observers and speakers, has to be disclosed by the theoretical model and not (in the shape of the Matrix Sense) be treated as something “in terms of which experience is possible” (p. 141). Time may indeed, in harmony with Kant (but without accepting his a priori conception; see 1.2, 2.1–2, 4.6.8), be understood as a prerequisite for our experience of motion and change, but obviously not in the sense of the ‘passage of time’ (p. 142), ‘eternity’ (p. 153) or container “extending infinitely” (p. 143) ‘out there’ independent of events; or rather other events, because the passage of time is conceived as “the event which subsumes all other events” (p. 142).

However, the problem is that time, according to the superficial metaphor, is conceived as a thing (Evans also speaks in a pertinent way of temporality being “reified”; p. 153) with properties of things, i.e., it moves, has extension, is divisible and continuous. It goes without saying that something with these properties cannot serve as an instrument for the analysis of the same properties, in particular motion involving other things. This contradictory picture (and main argument against theories based on the conception of ‘moving time; see above, 3.12, 4.4, 4.5, Ch. 7) cannot be explained by general statements like “the event which subsumes all other events” but requires, in my view, a model that reconciles the contradictory conditions as belonging to different (but [con]fused) cognitive-semantic levels of time processing.

It is interesting that Evans more or less intuitively indicates his awareness of hierarchical distinctions but lacks the support of corresponding hypotheses to discern the hierarchical-processual coherence of these distinctions. Notwithstanding isolated pertinent observations, the resulting impression experienced by the reader is ambiguity and, occasionally, incongruity. On the one hand, he observes – and I believe rightly so – that the secondary Matrix Sense should be distinguished from the “phenomenologically foundational temporal lexical concepts closely associated with perceptual and cognitive abilities [pertaining to the four primary senses; my remark]”, which would in a way correspond to the hierarchical-processual view. On the other hand, he appears to assume a distinct kind of foundation in the shape of “the
Matrix in terms of which experience is possible” (p. 141), an idea that was rejected above. It might, of course, also refer to the underlying continuity (effected by biological rhythmicization and understood by Evans to be temporal) as prerequisite for all perception, but then the Matrix would rather be on a par with or – more properly, implied by – the basic ”perceptual and cognitive abilities”. This is also the interpretation that comes to mind when we are confronted with Evans’ view that ”the temporal Matrix is being conceived as a template, an instrument which serves as a reference for measurement” (p.144).

It is not entirely transparent in which sense the Matrix, according to Evans’ definition, should be ”derived from socio-cultural imperatives” (p. 141). If the Matrix Sense is a reflex of the superficial Metaphor III, postulated in my model, it is evident that it is indeed closer to such socio-cultural conditions than are the antecedent cognitive deep Metaphors I and II, applied in the establishment of space and motion as prerequisites for temporal analysis. However Metaphor III (i.e., of ’moving time’) has a considerable cognitive depth, too, as demonstrated by our falling prey to it occasionally and unconsciously. Apparently, merely a logical-coherent analysis can help us realize that saying ‘derivation’ (”from socio-cultural imperatives”) here is ambiguous, whereas Evans’ other wording, viz., ”socio-cultural importance ascribed to” a sense like the Matrix (p. 141), seems to convey more properly the reasonable assumption that a superficial metaphor like the one involved is likely to give rise to ”rich patterns of concept elaboration” (p. 141), viz., of the socio-cultural kind, and, consequently, is to a greater extent subject to culture-specific variation.

In his discussion of the hypothetical derivation of the Matrix Sense (p. 153ff.), Evans presents further observations very much reconcilable with my own analysis (Thelin 1999: 274ff.; 2002: 62ff.; see above, 3.16) but left unrelated not only to a hypothetical model of temporal ontogeny but to his own synchronic analysis as well. When he says that ”a Matrix conception could only have become associated with time if temporality is in some way reified” (p. 153), this is in fact what Metaphor III is all about. When he further says that ”[temporality] must be generalized away from the individual intervals from which it derives, and thus divorced conceptually from its bounded durational character, anchored to the subjective […] awareness of the experience” (p. 153), this is a statement that I could accept on the same grounds, albeit with certain reservations. Besides the inclusion of the experiencer and his/her subjective perspective (as I would rather put it), though lacking systematic considerations in Evans’ aspectless theory, this statement generally conveys my assumptions about the working of Metaphor III, viz., as an abstraction from the discontinuity established by temporal analysis, namely such that – under the influence of secondary, synthesized, continuity – the underlying operations (a) establishing motion as extended, divisible, and continuous object, and (b) analyzing motion by temporal discontinuation, are
amalgamated in cognition so that time itself is ascribed the properties of motion, extension, divisibility, and continuity (see above, 3.16). My reservations concern Evans’ view that the derivation discussed starts from ‘intervals’, if understood to represent the “bounded durational character” (p. 153) and origin of temporality. As I have demonstrated above with regard to synchronic temporal processing, duration, as delimited extension, is rather the outcome of temporal analysis, viz., aspectual totalization operating on non-temporal, divisible continuity. However, in the hypothetical model of temporal ontogeny suggested above (8.2.2–5, 8.3, 8.4.1–3, 8.4.8), duration is assigned the role of a starting point for temporal-perspectival analysis.

There is actually a more basic weakness in Evans’ lexical-semantic analysis, illustrated also by the Matrix Sense and originating precisely in the lack of an explicitly perspectival understanding of time. The reader will no doubt discover that Evans’ choice of examples is restricted to uses of the lexeme time in contexts almost exclusively representing situational-aspectual background. The Matrix Sense is typically associated with conceptions of ‘infinite elapse’ (p. 141), ‘absolute time’ (p. 142), and ‘eternity’ (p. 153). But is there any cognitively compulsory relationship between the metaphor of ‘moving time’ and the non-time-related meaning of (remote) background? Certainly, not. This metaphor is perfectly well reconcilable with the time-related foreground as well. As it happens, this condition can be proved by a single example adduced by Evans himself in his discussion of concept elaboration employing motion content (p. 148):

(11.7) Time passed. A million other things happened, most of them forgotten. I broke up with my girlfriend and, after a while, met, fell in love with and married someone else.

This is a typical plot line of foregrounded events succeeding one another by way of their total aspectual delimitation from each other. Instead of drawing conclusions from this for his definition of the Matrix Sense, which is overtly contradicted by the completely normal reference here to a delimited elapse of time, Evans confines himself to the short comment that “the narrator appears to be equating the ‘passage’ of time with change” (p. 148). But this is the vital point: change, i.e., the ending of a definite elapse of time as a prerequisite for the succeeding events taking place is in reality a serious challenge to Evans’ lexically based theoretical construction. In Russian, for example, ‘time passed’ in the present context could only be expressed by using the perfective verb form (conveying the total aspectual perspective): ‘Prošlo (PF) vremja’.
11.2.15 The Agentive Sense

The secondary sense of time suggested next by Evans is the *Agentive Sense* which according to his analysis derives from the Matrix Sense by "further reification". As distinguished from the latter "which is conceived as [...] serving to manifest change", the Agentive Sense "in addition [...] actually brings about and hence causes change" (p. 159). Let us look at two illustrative examples of this sense (ibid.):

(12.1) a. Time is the great physician  
    (12.1) h. Time has yellowed the pages

It is obvious that examples like these indeed represent (underlying) semantico-syntactic structures containing an agent, an action, and an object (goal). They can, accordingly, be said to constitute telic (terminative) constructions. Whether they by necessity also imply change (i.e., the achievement of a terminus), as argued by Evans, we shall see in a moment. At this point I would like to remind the reader that the Matrix Sense, or rather the superficial metaphor of 'moving time' on which it is based, was shown above not only to 'serve' "to manifest change" (in agreement with the template idea of unbounded time rejected above) but also to be perfectly apposite in expressions manifesting change, viz., as a *foregrounded definite elapse of time*. I showed that the distinction involved could be explained most naturally by the temporal, i.e., aspactual, perspective. It appears logical to expect that Evans’ definition of the Agentive Sense (derived from the Matrix Sense) would suffer from the same deficiency. If we choose instead to apply the partial ('processual') aspactual perspective to (12.1) h and not the total perspective used now, we would, in a corresponding way, see no change-of-state: *Time is yellowing the pages*, or similarly (applied to some of Evans’ further examples), *Time is aging me, Time is leaving its scars, Time is transforming her*. What we see is rather a movement directed toward the object (goal) and affecting (approaching) it, viewed in process (a state of continuous change) but *not* including its final outcome: a change from an old state to a new state. Under these circumstances it would certainly not be possible to accept the argument of "additional meaning" (p. 160) for the establishment of the Agentive Sense either, since change-of-state is conceivable also in the Matrix Sense.

The substantial difference between the two senses of time as analyzed by Evans has rather to do with their appearance in two distinct semantico-syntactic structures: the Matrix Sense in propositions containing exclusively *states* or *activities* (p. 142) and the Agentive Sense in propositions exclusively containing *accomplishments* or *achievements* (p. 159). However, this distinction is not temporal in essence. Now, there is a relationship of dependence in the restricted sense (already indicated above) that achievements of
necessity require the total aspectual perspective to signal the obligatory achievement of a terminus (and do not accordingly allow of the partial, ‘processual’, perspective).

Now, if Evans’ definitions of the two senses cannot be maintained, how could we more convincingly explain the evidently distinct use of the lexeme *time* in the two semantico-syntactic contexts? Would it, for example, be reasonable to assume that the contexts decide the actual meaning of the lexeme as additions to some basic temporal meaning? Which, then, would the latter be? No, such an assumption would not be reconcilable with a hierarchical-processual view of linguistic encoding and decoding where the proposition is understood to be the outcome of a coherent feedback process involving, in interaction, all its underlying elements. From this standpoint it appears indispensable to make explicit the hidden metaphors at work. It is obvious that the two senses discussed derive successively from what I have called Metaphor III (Thelin 1999: 275; 2002: 63; see 3.16), i.e., the metaphor of ‘moving time’, or, more properly, from a secondary concept of time as a thing ascribed motion, extension, divisibility, and continuity. From a passive thing involved primarily in motion or activities a subsequent metaphor is now understood to create an agent involved in accomplishments and achievements. This process of metaphorical meaning extension is thus understood to contribute rather to the increasing polysemy of the lexeme *time*, while preserving its hierarchical-processual feedback connections not only with Metaphor III but with the preceding deep Metaphors I and II as constitutive parts of the core complex of temporal processing as well. Such an explicit hypothesis of the metaphorical working indicates that the increased polysemy of the lexeme *time* has not to do with meanings of time in any deeper sense, and more specifically, cannot be treated as a matter of absence vs. presence of change-of-state.

Accordingly, explicit considerations of metaphorical hierarchy and, in particular, of the aspectual conditions might have led Evans’ analysis in another direction. As matters stand now, on the one hand, he makes the insightful observation that the Agentive Sense derives from the Matrix Sense by way of “further reification” (p. 159), which reflects adequately the hierarchy of metaphorical transformation suggested by me above. But, on the other hand, this observation remains unrelated to a holistic-coherent model of temporal processing. This becomes particularly evident from his attempt to motivate this transformation as founded on ‘implicit agentivity’ and “awareness of change in the world-state” (p. 166) already ascribed to the Matrix Sense. These assumptions originate in the idea that time (“the temporal Matrix”) as template or ‘container” brings with it new events’ and therefore “implicates agentivity” (p. 166). The ‘container’ conception of time was rejected above, and the idea of ‘implicit agentivity’ can be refuted on the same grounds. Events (in the sense of accomplishments and achievements) and their agents are introduced only by the subsequent metaphor
operating upon the metaphor of 'moving time' and thus transforming it into 'acting time'. As proof of 'implicit agentivity' Evans suggests the following example:

(12.18) Time is like a river made up of the events which happen, and its current is strong; no sooner does anything appear than it is swept away, and another comes in its place, and will be swept away too.

[Marcus Aurelius]

Evans’ reasoning is transparent: we are supposed to understand this quotation as an example of the Matrix Sense of time, i.e., river, in combination with Agentive Sense properties like 'strength' and the 'ability to sweep things away’. However, why are we likewise supposed to understand the latter properties to be implicated? In my view, they are explicated clearly enough. Therefore, why should time as river, already exhibiting these properties, be understood to represent the Matrix Sense? From the standpoint of an explicitly hierarchical-processual account of the successive metaphorical transformations there is no Matrix Sense present any more (except as a derivative-accumulative fact) after the Agentive Sense has been involved, the corresponding metaphorical operation having taken place. It is one thing to say 'Time is like a river; it flows’, another to say 'Time is like a river; it is strong and sweeps things away’. In the first case we see the metaphor of ‘moving time’ at work, in the second – the metaphor of ‘acting time’ operating on the former. Actually, we might as well understand river in the first case to represent a further metaphorical transformation from the original metaphor simply ‘of motion’ (Thelin 1999: 253). There is, as far as I can judge, no intermediate stage of implicature exhibited by these examples. Such a construction appears to be motivated instead by Evans’ need for a logical transition from his problematic definition of the Matrix Sense as "manifesting new events” and thus "implicat[ing] agentivity”, as well as being correlated with "an awareness of change”, to his corresponding definition of the Agentive Sense as explicitly manifesting the agentive properties and, in particular, a compulsory change-of-state. This construction does not withstand confrontation with the evidence advanced above, viz., that there is no manifestation of new events or any agentivity implied by the Matrix Sense, i.e., the metaphor of 'moving time' (my Metaphor III; see 3.16), nor is change-of-state restricted to the Agentive Sense, i.e., the subsequent metaphor of 'acting time’. Considerations of aspectual perspective make it more than likely that change-of-state is reconcilable with both senses.

Evans’ interpretation (p. 164ff.) that his Agentive Sense "offers a slightly different way of viewing the situation", resulting from Lakoff and Turner’s metaphorical treatment of agency in time by virtue of metaphorical mappings, appears justified to me and could be understood to involve a certain degree of the hierarchical dependence generally assumed by my model. In
agreement with the corresponding explicit hierarchy of metaphors, the Agen-
tive Sense can thus be said to imply the introduction of one superordinate
metaphor of ‘acting time’ which forms the basis for further metaphorical
extension by various kinds of ‘acting time’. This appears well-founded in the
light of the hierarchical-processual line of transformation sketched above
and extended to some degree below (for the sake of clarification): Metaphor
III of ‘moving time’ > Metaphor IV of ‘time moving like a river’ > Meta-
phor V of ‘acting time’ > Metaphor VIa of ‘time acting like a river’, VIb of
‘time acting like a physician’, etc.

11.2.16 The Measurement-system Sense and the Commodity
Sense
The last two secondary senses of time suggested by Evans, the Measure-
ment-system Sense and the Commodity Sense, concern peripheral and appar-
ently less problematic meanings of time, at least from a synchronic, tem-
poral-perspectival standpoint. From the diachronic standpoint of cultural
learning and cognitive-linguistic ontogeny, however, time as measurement
of the duration of events (in a non-technical sense) must presumably be as-
cribed a decisive role for the development of the entire complex of temporal
processing (Thelin 1990b: 99ff., 103–106, 109ff; see above, 3.16, 8.2.4, 8.3–
4). This assumption is in a way reflected by the fact that Evans (p. 175) de-
rives the Measurement-system Sense from the Duration Sense, ascribed by
him the status of Sanctioning Sense. However, from a synchronic point of
view the status of the Duration Sense, in particular as Sanctioning Sense, is
questionable as we have seen, and considerations of aspeclual perspective
suggest another solution, as will be demonstrated below. This would also
apply to Evans’ derivation of the Commodity Sense, ascribing value to time,
from the Duration Sense. It will turn out that both senses can indeed more
naturally be derived from the Matrix Sense understood to imply my Meta-
phor III of ‘moving time’.

This is precisely what Evans’ analysis overlooks: the metaphorical step
transforming the (aspectual) delimitation of the duration of events (by means
of other events) to the (equally aspectual, although transformed) delimitation
of the duration of time abstracted (’liberated’) from these events. This dis-
tinction is obscured by Evans’ temporal interpretation of underlying, biolog-
ically motivated, non-temporal continuity, as well as his non-explication of
the event structure implied by his ‘intervals’. To account for the fact that the
two senses discussed express measurement and value of time and not of
events, we must resort again to my Metaphor III ascribing properties of
things to time, primarily that of extension, subject to delimitation by means
of aspeclual perspective. The fact that Evans in this connection does not say
a word of his Matrix Sense, which would indeed have been responsible for
this metaphorical transformation, is due not only to his temporal understand-
ing of non-temporal continuity and neglect of the event structure underlying
the intervals of his Duration Sense, but also by his infelicitous assumptions,
following which the Matrix Sense, viz., as ‘infinite elapse of time’ is de-
prived of delimitability and, consequently, measurability. Had this not been
the case, Evans would have realized that both the Measurement-system
Sense and the Commodity Sense in fact presuppose – for the establish-
ment of temporal extension and delimitability – the antecedent metaphor of
‘moving time’ or, more generally, the ‘temporal reification’ handled by his
Matrix Sense (and my Metaphor III).

In the light of aspectual theory there is, as we have seen, no need to as-
cribe to duration any role of Sanctioning Sense in the synchrony of temporal
processing. Duration is the outcome of events being measured by time in the
form of aspectual delimitation, i.e., the total perspective on events (or their
equivalents) marking their beginning and ending. The application of my
Metaphor III implies a cognitive inversion: instead of measuring (in a broad
sense) events with the aid of time, we now measure time with the aid of
events, while ‘forgetting’ about the events. To this abstracted concept of time
as extension (‘line’ or ‘axis’) we bring, in transformed shape, the aspectual
perspective of totality for the establishment of duration by delimitation, that
is to say, its role is assumed by points in time marking the beginning and
ending of periods of time. As already indicated above with regard to the total
view of events, points in the transformed aspectual sense are not necessarily
restricted in their extension either; the decisive thing is that they are viewed
as confined entities, be it a second or a century. This condition is understood
to hold not only for the use of points in establishing duration by delimitation
but also for the determination of singular points in time by delimitation from
other points; cf. Evans’ example

(13.9) a. The time is (a) quarter to eight

That such determination may imply an arbitrary extension in time (without
thereby merging a temporal-aspectual point with a temporal-aspectual peri-
od) is evidenced by examples like It is bed-time, The time is late 19th centu-
ry, etc.

In agreement with the discussion above it would thus be possible to ana-
lyze Evans’ (p. 172) elaborations of the Measurement-system Sense in terms
of motion (cf. his example (13.7) ‘The time is approaching noon’) as deriv-
ing rather from his Matrix Sense, i.e., to regard motion, implied by my cor-
responding Metaphor III of ‘moving time’ (along with the other thing-like
properties), as basic for this sense as well. There would then be no elabora-
tions of the Measurement-system Sense here. According to such an interpre-
tation, the metaphorical abstraction of ‘moving time’ from the general idea
of a continuous flow of events (Metaphor III) would be the foundation,
whereas associations with "the motion of a clock hand", to which Evans (p. 172) refers as the presumptive origin of the elaborations he posits, would play only a subsidiary and specialized role. The use of the partial aspectual perspective (the 'continuous form') in Evans' Example (13.7: The time is approaching noon) points in the same direction. This aspectual perspective of reference to a definite part or phase of a movement differs from the corresponding reference to a potential part or phase in cases of duration (delimited extension) of a movement, from which Evans, in terms of his Duration Sense, wants to derive his Measurement-system Sense. In my view, it would be more natural in this regard as well to assume that the metaphor of 'moving time', conveyed by his Matrix Sense, is alone responsible for secondary conceptions of thing-like properties in time like mobility, extension, delimitability, and value. No Duration Sense needs to be involved.

Aside from these general observations, it should be noted that Evans' treatment of the Commodity Sense (pp. 177–183) stands out as a particularly insightful exploration of how a superficial metaphor of time, like the value metaphor, derived from the idea of time's (de)limitation, interacts in intricate ways with social and economic conditions of a culture-dependent nature (cf. my discussion in 1.15). In concluding this section, Evans brings the issue of universal vs. language-specific (or typological) properties of time into relief by making the important observation that "how other less well-studied cultures [than the English] conceptualise time is a vast uncharted area […] which requires the urgent attention of linguists." Such research would indeed be of great significance for the future evaluation of our partly diverging theoretical models of temporal processing – not only with regard to apparently surface-related metaphors but also to the hypothetically deeper metaphors of space and motion as the very basis for the construction of time.

11.2.17 Models for time

On the basis of the eight (four primary and four secondary) senses of time ('temporal concepts'), as well as the three tenses present, past and future (see above, 11.2.4, 11.2.5), Evans proceeds in Part III of his book to the ultimate goal of his investigation: the advancement of models of time. These are the Complex Moving Time Model (referred to below as MTM), the Complex Moving Ego Model (MEM), and the Complex Temporal Sequence Model. Since the latter was already discussed above, our attention here concerns the MTM and the MEM. According to Evans, the purpose is "to describe these two models and show how the range of primary and secondary temporal concepts […], together with the way in which many of these concepts are elaborated, are integrated into these two coherent models of temporality" (p. 211ff.). This description is preceded by a preliminary discussion of motion and agency (pp. 201–210). According to the so-called 'active-determinative principle' (suggested by Talmy), motion is ascribed either to time or to the
experiencing Ego. After the discussion above (see especially 11.2.2) the reader should be aware of the fact that when Evans finally ascribes a decisive role in temporal processing to motion, this is not the motion on which time operates but the motion of time in the secondarily derived sense of metaphorical elaboration handled by my surface-related Metaphor III. This fact alone arouses a certain hesitation in the reader, in particular when he/she is confronted with Evans’ own theoretical evaluation of his cognitive models: ”[I]t is this level of conceptual organisation which evidences processes of the following kind: abstraction, inferencing, prediction and the modelling of complex temporal relations. It appears then that much of our understanding about, and reasoning in terms of, temporality is likely to relate to the level of temporal cognitive models” (p. 232).

The last assumption obviously depends on the nature of these models. The metaphor of ‘moving time’ (or ‘moving Ego’) cannot reasonably be the foundation of a theory of time accounting for the ”abstraction, inferencing, prediction, and the modelling of complex temporal relations” in any comprehensive way. According to my model, this can be the case only if the enumerated cognitive functions are understood to include an account of how time in coherent ways interacts hierarchically-processually with the perception of space, motion, and change (on the basis of biologically motivated, non-temporal continuity). The lexical-semantic approach relying on superficial metaphorical elaborations simply lacks the basis for a coherent derivation of time from primarily being an instrument for the perspectival analysis of motion/change to secondarily being a thing with thing-like properties like motion, extension, agency, and value.

A theory of time based exclusively on the secondary cognitive-semantic function of time cannot claim to offer “a richer and more elaborate understanding of how time is conceptualised and organised”, nor to provide a ”methodology for employing linguistic evidence as a way of investigating conceptual structure, and criteria for formulating and evaluating theories of conceptual organisation” (p. 226), unless this claim is qualified explicitly as pertaining merely to superficial levels of temporal processing and, accordingly, the main object of Conceptual Metaphor Theory (CMT). In this respect alone Evans’ cognitive models may offer a more complex understanding of how the concept of time is elaborated metaphorically. To what extent and how such complexity is indeed captured by Evans’ lexical concepts of time (including the tenses) is uncertain, though, given the incongruities shown above to inhere in them. Our observations so far indicate that the theoretical adequacy of Evans’ model in terms of logical consistency and explanatory-predictive capacity is bound to be severely affected first of all by the non-consideration of perspectival, i.e., mainly aspectual, conditions. Let us examine in greater detail whether this apprehension is justified.

First of all I would like to remind the reader that Evans chooses to base the core of his theory of time on precisely the most vulnerable hypothesis of
traditional temporal (tense) logic, viz., that mobility is a primary property of
time (see above, 4.4–5, Ch. 7, 11.2.2). This idea, as we know, originated in
temporal logic’s exclusive preoccupation with tense and, most importantly,
its usual neglect of the moment of speech/observation as the explicit, stable
point of departure for temporal perspective (both tense and aspect) in all
kinds of propositions (observations). Only by abstracting from this funda-
mental principle can we conceive of time as moving past the Ego or, con-
versely, the Ego as moving in time. It is this idea that Evans takes over from
tense logic – without accounting for its cognitive-semantic origin.

The outcome is in reality not a speaker/observer that actively interprets
events by assigning a temporal perspective to them but either a passive Ego
that, if stationary in the present, notices how future events move toward it,
then behind it, and thus become past (pp. 214–217); or, conversely, an equally
passive Ego that moves along with the present toward future events and
past them, thereby turning them into past events (pp. 218–221). In the former
MTM case Evans does not refer in his introductory definition to the existence of underlying events but speaks merely of locations. These locations (as elaborations of the tenses) are understood to move constantly by virtue of the
Matrix "which is ongoing and infinite" (p. 215). In the latter MEM case he
speaks of "temporal events [which are] 'located on' the temporal landscape
and constitute 'locations'.” Accordingly, “the Ego 'moves over' or 'across'
the temporal landscape” (p. 219). In both cases, as expected, no explicit ref-
ence is made to a stable moment of speech / observation as the point of
departure for perspective. Evans introduces his conception of "deictic cen-
tre” that might play this role in the MTM, but his examples (pp. 214–215) do
not illustrate moving time. The conception of “deictic centre” does not ap-
pear at all in his account of the MEM (pp. 219–222). However, the statement
that, in the MTM, "the Ego correlates with the concept of Present” and “the
Ego’s location (the deictic centre) constitutes the Present” (p. 214ff.) could
in fact also be made about the MEM. The important distinction is that in the
MTM the Ego/Present is stationary but is mobile in the MEM. Now, the
decisive consequence is that in both cases the abstraction from the original
stable moment of speech/observation, caused by the obligatory motion of
either time or the Ego, deprives it of its role as foundation for stable time’s
exercising its perspectival analysis and, most importantly, distinguishing
precisely between events involved in motion/change and events not so in-
volved.

In this connection Evans makes the puzzling distinction that in the MTM
"the Ego’s location […] constitutes the present”, whereas in the MEM "the
'location' of the Ego at any particular time constitutes the Present” (p. 219;
my emphasis). Is not the Ego’s location always primarily identical with pre-
sent time, whether the Ego moves or not? What “particular time” in the
MEM does Evans thus have in mind besides present time? Is this not the
result of a possible circular reasoning caused by the lack of a clear distinc-
tion between events and time? Why does he refer to the entities moving past the Ego as locations (p. 215), but the entities toward and past which the Ego moves as "temporal events" (p. 219)? If the MTM and the MEM are understood to be the outcome of metaphorical abstraction of time from event structure, why should Evans recur to events explicitly in the introductory definition of the MEM but not of the MTM? Is it because time’s motion toward and past the Ego/Present still makes sense to us (without the underlying event structure being disclosed), whereas the Ego/Present’s motion from the past toward the future and past it is, actually, in part senseless because it cannot continue past the future without having a new future in front of it, unless we restrict it by events which, notably, are supposed to be thought away? The answers to these questions are, in my view, to be located in the lack of hierarchical-processual coherence in Evans’ model of temporal processing and the incongruities of his temporal lexical concepts. The first signs thereof we see in the ambivalence demonstrated by the introduction of different definitions of the Ego/Present relationship in the two models; the at first glance obscure temporal system besides the one defined on the basis of the Ego/Present; and the notion of "temporal events" applied differently in the introductory definition of the MEM (p. 219ff.) and in the definition of the MTM (pp. 214–215), respectively (see the further detailed discussion below).

In order to get beyond these overt signs of inconsistency we have to remind ourselves of the nature of the temporal lexical concepts postulated by Evans. It is evident that his Matrix Sense as ‘infinite elapse’ and ‘passage’ of time is ascribed a decisive role in both models. Besides the three tenses, the two models also share the Duration Sense, the Moment Sense, and the Event Sense. According to Evans, the Event Sense "brings with it the notion of temporal events" (p. 216). Why this is so remains unexplicated. We can only infer that this is because the Event Sense is assumed to be a sense of time and thus events must be temporal. However, this apparently implies that events are understood to be temporal in a more general way than assumed before (pp. 135–140; see 11.2.13), viz., "as being embedded within the temporal Matrix which in ‘conveyor-belt’ fashion brings the temporal events with it" (p. 216). This is, according to Evans, how the "motion of the temporal Matrix past the Ego" (p. 216) is thought to work in the MTM. In the MEM the picture is the reversed. Evans has to assume here a new conceptualization of the Matrix that removes its characteristic feature of motion and changes it into an immobile "temporal landscape" (p. 220) across which the Ego moves. The temporal landscape metaphor he treats as an elaboration, in turn, of the "linear path" elaboration from the Matrix Sense (p. 220). No motivation is offered as to why the temporal landscape metaphor should only be integrated with the MEM and not also with the MTM because it appears to be just a variation of Evans’ ‘container’ conception of the Matrix. Would it not be simpler if we regarded the shifted role of mobility as decisive and,
given Evans’ assumptions, imagined in the MTM a moving container / landscape of events, and in the MEM an Ego moving through an immobile container / landscape of events?

If we overlook the ’container’ conception, rejected above (3.12, 4.7–8), it should be noted that Evans understands ”awareness of the ’passage’ of time” to be implied by both models (pp. 217, 220). The question arises, of course, whether there is not also a derivational hierarchy between the two models, such that the MEM hypothetically derives from the MTM, viz.: motion of events > motion of time > motion of the Ego applying time (temporal perspective) to events. Evans’ predominantly lexical-inductive treatment does not raise this question. There is still something intuitively right about the landscape metaphor that makes it more acceptable than the container metaphor for the MEM. How could we account for this in a cognitively plausible way not accounted for in Evans’ integration of it in the MEM? I suggest this has to do with the way we conceive of the Ego in the MEM: as distinguished from its role as observer of events in the MTM, the MEM implies its transformation into a subject itself involved in an event on a par with the ’frozen’ events it passes by. This would explain why in the MEM Evans places the Ego on a line with the surrounding ’temporal events’ (p. 219), whereas in the MTM he places it on a line distinct from the moving Matrix of ’temporal events’ (p. 215). We may now better understand why he prefers to define the MEM in terms of ’temporal events’ (p. 219) and the MTM in terms of ’locations’ (p. 214ff.), although ’temporal events’ are included in both models (albeit in distinct hierarchical relations to the Ego), and ’locations’ appear as elaborations of events in the MEM as well (220). There is no explanation why there are no corresponding explicit elaborations in the ’elaborative consequences’ for the MTM (p. 217). They may be presupposed by the events embedded in the moving temporal Matrix.

Here we encounter again, precisely as in the case of the MEM (p. 219), an obvious reference to more than one system of time. In his account of the integrated elaborations resulting in ”awareness of ’passage’ of time” in the MTM, Evans suggests that we are concerned with ”motion of the temporal Matrix (and hence embedded times and events)” (p. 217). What are we supposed to understand here by ”embedded times” (moving ”past the Ego”)? This is not self-evident, but the only possible answer I can think of is that ”times” refer to temporal Moments (see above, 11.2.11, 11.2.13). Such an interpretation is justified by Evans’ statement: ”Like temporal Events, temporal Moments are conceptualised as discontinuous and iterative in nature. Accordingly, just as temporal Events are embedded in the temporal Matrix, so too Moments of time [sic!] can be borne along” (p. 216). Now, this is a significant displacement of meaning from the Moment Sense of time discussed above and demonstrated by me to be identical in essence with the Event Sense. Since we, in reality, have to do in both cases with events causing change-of-state, conveyed, according to the proposed model, by the total
aspectual perspective, we might indeed be concerned with discontinuity but not with iterativity in any easeful way. An assumption of iterativity can be understood here only to reflect the questionable idea that the Matrix not only contains events but also represents a continuity of "moments of time", i.e., a temporal system in its own in addition to the tense meanings metaphorically ascribed to time as a definition of its relation to the experiencing Ego. There is no other point of observation and hence no other temporal system involved in the metaphor of 'moving time'. Nor are there, indeed, any events other than the movement of time, since they have been thought away. In the metaphor of 'moving Ego' the conditions are equivalent, only the point of observation coincides with the sole event, the movement of the Ego through time. Except for the temporal distinctions determined by the Ego/Present there is no other 'particular' time here either, and there are no other events because their absence is by definition the precondition for the illusion that we move through time.

Such is, in my view, the essence of the metaphors of 'moving time' and 'moving Ego. In order to illustrate this general state of affairs, let us once more examine the lexical concept of time on which Evans founds his models and, indeed, his theory of time (cf. p. 213): the Matrix Sense. Departing from the assumption that this concept implies "the ascription of motion which is continuous and ongoing" (p. 214; see also 11.2.14), as well as examples like Time flows on forever, he now adduces a different example:

(17.1) Time flows by

As distinguished from the former example, the latter one, according to Evans, "presupposes a deictic centre" (p. 214), in traditional terminology, the moment of speech/observation. Now his reasoning is that since this deictic centre or any 'landmark' "is not encoded linguistically", there must be a "cognitive model beyond the Matrix Sense" (p. 214) that accounts for its invocation, viz., by "the integration of motion associated with the temporal Matrix and the Ego as constituting the experience of the present" (p. 217). This assumption accounts satisfactorily for the way the perceiving Ego is deleted by abstraction from the underlying cognitive structure. However, this is a successive process, since we must assume a moment of speech / observation in all kinds of propositions, including Time flows on forever. The fact that we are not aware of it any longer (cf. also Birds fly, Fishes swim) has apparently to do with the generic sense of the propositions that generalizes them successively from situations determined spatially and temporally. Now, temporal perspective is not considered in Evans’ models. Had it been, he would probably have realized that the awareness of the perceiving Ego is dependent on aspect. In an example like Time was moving/passing by (slowly/quickly), the 'continuous' form (i.e., the partial or 'processual' aspectual meaning) conveys not variations of the temporal-perspectival remote back-
ground, as in the preceding examples, but the close background (directly related to the foreground) and actualizes unambiguously the temporally definite point of observation occupied by the Ego (i.e., Evans’ deictic centre), although not encoded linguistically. As we saw above (11.2.14), the non-consideration of aspectual conditions prevents Evans’ Complex MTM from handling the delimitation of time’s ‘passage’ by way of the total aspectual perspective (cf. Time passed [...]; cf. also Time had simply flown, The hours flew as she busied herself about the house). Consider also Evans’ own example:

(17.6) A lot of time has passed/flowed by.

The concepts of motion and ‘deictic centre’ obviously do not suffice to account for such completely normal cases. To treat them as Matrixes within Matrixes would not only be awkward but impossible since Matrixes, according to Evans, are without boundaries (see 11.2.14). This is, in fact, the way he treats ‘temporal events’ (the Event Sense) and ‘temporal moments’ (the Moment Sense), i.e., as “embedded in the temporal Matrix” (p. 216). Accordingly, he says with regard to his examples The young woman’s time [= child birth] and A time for a decision (see 11.2.11, 11.2.13) that they ”can both be ‘approaching”‘ (p. 216), i.e., by virtue of the moving Matrix in which they are embedded.

The latter statement and the included roundabout and accidental way of referring to conditions of aspectual essence (in the actual case, the partial or ‘processual’ aspectual perspective) demonstrate in a nutshell the dilemma of Evans’ superficially-metaphorically based lexical-semantic approach to time. It also indicates that much of the complexity exhibited by his models is due to the necessarily inductive nature of this approach. Would it not be more logical, and realistic, to treat the temporal properties of events as a perspective on these events rather than deriving them from some superordinate absolute motion, postulated, moreover, on the basis of a superficial metaphor? These observations, more generally, indicate that Evans’ inductive distinction between primary metaphors and the complex (‘compound’) metaphors handled by his models, should rather be reviewed in the light of and compared to the hierarchical-processual complexity warranted by the application of a predominantly deductive method. Corresponding and to a greater extent holistic-coherent models of time could, as the discussion has shown, not possibly neglect aspectual-perspectival conditions, or restrict themselves to the lexical-semantic level and to temporal metaphors of a secondary nature.

However, the fact alone that Evans has addressed this issue as a matter of theoretical significance is important, especially in the broader perspective of time studies based empirically on more comprehensive methods and theoretical models. From the latter perspective, it would accordingly be essential to understand how temporal metaphors may be derived coherently from the
motion of events. Naturally, this question is not and cannot be addressed by Evans in any way that satisfies either explanatory or predictive adequacy of description. As indicated already, the reason for this lies in his deliberately restricting his analysis of temporality mainly to the lexeme *time* and thus to event structure only to the extent that it is contained in the semantics of this lexeme. Accordingly, his analysis centres almost entirely on the superficial metaphors of time, overlooking time’s fundamental role as a means of the perspectival analysis of events. This choice prevents him from transcending the predominantly inductive method of analysis. The restricted amount of deductivity introduced by the conditions of inference in his cognitive models is undermined by the demonstrated incongruities of the temporal lexical concepts (caused, in turn, mainly by non-discernment of aspectual conditions) on which these models are founded.

11.2.18 Physical and cognitive views of time

Evans wraps up his book with an account of *Time in modern Physics* and a concluding statement on *The structure of time*. The former is an instructive survey of the conceptions of time advanced by the theories of relativity, on the one hand, and the different conceptions of time based on human perception and cognition, on the other. That Evans takes sides with the latter ‘embodied’ view is natural and evident from his quotations of Bergson’s and Davies’ critical assessments of Einsteinian relativistic time. This standpoint could have been reinforced by references to Bohr and quantum mechanics (see 1.11, 3.12). It remains a troubling fact, however, that Evans’ concept of temporal Matrix is an obvious reflection of Newtonian absolute time.

11.3 Summary

As was the case with some of the preliminary standpoints expressed by Evans in the introductory Part I of his book (see 11.2, esp. 11.2.3, 11.2.8), so also is the case with the general views advanced in his concluding statement: they represent a realistic understanding of the essence of temporal processing that unfortunately remains not only unintegrated in but also is, in part, contradicted by his ultimate models of time. This pertains typically to his sound view of time as ”a means of segmenting and so analysing experience, processing raw perceptual data into events and states, into change and stasis” (p. 251). Whereas in my models (Thelin 1999: 302, 2002: 60; see 3.16, 4.8) precisely this view has been realized by attempts at a systematic exploration, in particular regarding the hierarchical-processual nature of the perceptual-cognitive transformations responsible for this ”segmenting […] analysing […] and processing”, in Evans’ models this view has not been
elaborated by any corresponding hypotheses that would permit a comprehen-
sive understanding of the emergence and functioning of time. This condition
holds for such crucial issues as our understanding of the interaction of time
and change (p. 253; see 11.2.2, 11.2.8, 11.2.13, 11.2.15) and the role we
ascrIBE to duration in the synchronic model of temporal processing (p. 253;
see 11.2.8, 11.2.10, 11.2.13, 11.2.16).

Evans’ uncritical quotation of Bergson (p. 251) makes it evident that he
accepts and finds his own theory of time on the latter’s temporal under-
standing of “the continuity of our inner life” (whether we understand it as the
continuity of ‘consciousness’ or the endogenous, biologically motivated
rhythmical continuity applied to the outer world when being analyzed; they
may indeed turn out to be of one origin) and Bergson’s view that “this transi-
tion, all that is naturally experienced, is duration itself [my emphasis]”. This
conception of duration, like Newton’s absolute time, was shown above to
underlie Evans’ Matrix Sense (‘infinite elapse of time’), as distinguished
from his subordinate conception of duration resulting from the application of
‘boundary events’ to the former in his Sanctioning Duration Sense (pp. 108,
141; see 11.2.10). It was demonstrated (see 11.2.1, 11.2.8, 11.2.10, 11.2.16)
that both assumptions must be questioned: (a) Evans’ (and Bergson’s)
‘superordinate duration’ is not temporal, and (b) his ‘subordinate duration’ is
no Sanctioning sense of time, preconditioning other senses of time, but the
outcome precisely of temporal processing, viz., temporal-perspectival analy-
sis, delimiting by way of aspectual totalization the extension of events as
they are discriminated in the non-temporal, rhythmically based divisible
continuity applied to chaos.

Further pertinent features of time cognition mentioned by Evans pro-
grammatically but, again, not integrated in his models in any consistent way
are constructivity and discontinuity (p. 253). Hierarchy in temporal pro-
cessing can be said to be considered in embryonic, indeterminate ways (p.
254) answering to the predominantly inductive procedure of analysis.

To sum up the above assessment, it is already evident from its length that
we are concerned in Evans’ book with an attempt to tackle the time problem
that in innovative and utterly thought-provoking ways challenges many of
the findings established in recent years, in particular by biopragmatically
based cognitive-semantic models. From the discussion it should be equally
evident that his approach to time, notwithstanding its lexical-semantic re-
strictions, touches upon a number of crucial issues of temporal processing,
even though in certain important cases, like aspectual perspective, this takes
place in indirect and accidental ways. Since the lexical semantics of time
must naturally be viewed as an indispensable part of holistic-coherent mod-
elS of temporality, it is also evident that Evans’ proposals must be considered
seriously in future research and, on certain conditions (indicated above),
might be included in such predominantly deductive (abductive) models. His
impressive linguistic corpus and unusual acuity of analysis speak in favour
of such recognition. Particularly felicitous elements of his presentation, with potential value for future comprehensive syntheses of temporal processing, are – as pointed out above – his treatments of taxis, perceptual fields, and the value metaphor of time (the Commodity Sense).
12 Conclusions

Below I am going to present in outline the conclusions to be drawn from the biopragmatically based cognitive-linguistic exploration of time and the space-time relationship presented above. As became evident also from my assessment of Evan’s (2004) book in the preceding appended chapter, the choice of method is decisive for how successful we may be in modelling expressions of temporality theoretically. By paying proper attention to de-
ductive strategies of inference in cognitive processing, transcending the equally indispensable inductive ones (both operative in the holistic model of superordinate abductive regulation; see 3.2), we are no doubt in a more fa-
vourable position to achieving a coherent hierarchical-processual view of time’s emergence, with better prospects for explanatory and predictive ade-
quacy of description, than if we rely almost exclusively on inductive ones. Implied of necessity by this methodological choice is a multi-level analysis connecting linguistic facts with all preceding levels of processing that can be associated hypothetically with these facts in logically consistent ways.

The levels established are represented by the suggested hypotheses about underlying processes of a neurobiological, perceptual-actional, cognitive, and semantico-syntactic nature. Such processes are ultimately survival-orientated and thus teleological in nature, having as their aim a subject control-
ing the world by interpreting it. Interpretation takes place in a permanent circular feedback movement of analysis-synthesis interaction, assigning on the various levels of processing a significant role to analysis-by-construction (covered basically by deductive testing of hypotheses). The basic objects of such processing are things and motion, and, on levels representing more complex structure, events and situations. Space is the indispensable instru-
ment for the analysis of things and their interrelations, as time is for their motion. Both are perceptual-cognitive constructions and prerequisites for the analysis of events (activities, in a broad sense, and states) and the situations of which they are a constitutive part. Since abductive hypotheses take crea-
tive part in perception, perception is carried out from a definite perspective implied by these very hypotheses. Perspective applies not only to the percep-
tion of things spatially but to the perception of events temporally as well. Space and time are analytical, i.e. discontinuous, and perspectival in essence. They express the point of view on things, events, and situations held by the speaker/observer. The perspectival nature of time is illustrated with particu-
lar clarity by its manipulatory functions in narrative representations of situational structure (see 8.4.10.3).

Besides deductivism (and the role I ascribe to it along with inductivism in the abductive model), perspectivism is thus another of the methodological keystones I consider indispensable to any theory of temporal processing. The issue of integrating subjectivity and subjective perspective with cognitive-linguistic intersubjectivity is one of the connecting ideas running through my book (see, for example, Ch. 1, Section 4.8, and Ch. 6).

Given the crucial role of time in the perspectival analysis of events and situations, most typically fulfilled linguistically by the semantico-syntax of VP-structure (including, for example, adverbials, particles, and a differentiated prefixal/suffixal verb morphology) and, occasionally, by conjunctions (see Ch. 10), it is evident that a choice restricting our attention not only to the lexicon but to one single lexeme (in one single language, English), viz., the noun time, as is the case in Evans’ treatment of temporality, has methodological implications for theory formation. As demonstrated above, Evans’ lexical approach deprives itself of the possibility of transcending significantly the inductive level of analysis and, accordingly, penetrating the perceptual-cognitive levels of perspectival analysis signalled more consistently by other linguistic means. The predominantly inductive view closes our eyes to the temporal-perspectival meanings possibly inherent in the underlying semantico-syntax of the English lexeme time as well, or discloses them only in non-systematic ways. Most importantly, this or similar methodological restrictions (practiced more generally by autonomous linguistics as well as ‘autonomous conceptualism’; see 1.3) preclude the coherent hierarchical-processual connections of the linguistic expressions with the underlying (Gestalt) perception of events and the analysis of situations in terms of change-of-state and cause-effect in cooperation with aspectual perspective. Traditionally this has usually led to a confusion of the temporal categories aspect, tense, and taxis, and more specifically, of aspect and actional (verb) semantics (see 4.2, 5.1, Ch. 9).

Considerations of the deductive method within the abductive model, proposed here, have strengthened the hypothesis of constant circular feedback and the corresponding ordering of the temporal categories of aspect, tense, and taxis in a relationship of hierarchical dependence (see 3.12, 4.2). They have also provided the basis for an interpretative-constructive understanding of time in both a diachronic (ontogenetic) and a synchronic perspective, thereby rendering Kant’s a priori conception of time superfluous.

That the two most significant findings made in the course of my investigation into the nature of time – the abductive model, inspired by Hegelian dialectics and Peircean logic, and the pivotal, traditionally neglected, role of aspect in the concept of time – are intimately entwined in their workings is what one may expect from the natural interdependence of method and theory. It is only in the light of the interaction of induction and deduction, regu-
lated by abduction in a prominent manner of circular feedback, that time can be understood to be complex in a processual sense (cf. 11.2.7). Thus we are in a position to demonstrate its perceptual-cognitive workings as part of a hierarchical system of derivation assigning to the primary role of temporal perspective semantically consistent with its origin in spatial perspective. Accordingly, the proposed model of space/time cognition (see 3.16) is understood to embed organically – and most prominently – the processing of aspectual perspectivization (see 3.13), and function, in turn, within the superordinate abductive model of perception and mental/physical action (see 3.2). This integration is a vast task still awaiting its future detailed implementation.

For the first time, it appears, a theoretical model is in a position to derive hypothetically linguistic expressions of time all the way from pretemporal continuity effected by biological rhythmization, via pretemporal metonymic (Gestalt) partitioning as a general precondition for our perception of things, space, and motion, to temporal analysis/discontinuation by aspectual perspective in intimate cooperation with change-of-state and cause-effect analysis (see 3.8–11). Consequently, such a model has at its disposal the necessary instruments for disclosing, in the course of this derivation, the important workings – on different levels – of the perceptual-cognitive strategies of metonymy and metaphor, and distinguishing, in addition, between deep structure and surface structure metaphors in the cognition of time (see 3.8, 3.16, 4.4–5, 4.7–8, 11.2.1–2, 11.2.14–15, 11.2.17). Without the revelation of the latter distinction we would still be troubled by the superficial metaphor of ‘moving time’ as the chief stumbling-block in the history of time studies, viz., as the alleged essence of temporal semantics and corresponding basis for not only traditional temporal (tense) logic (see 4.5, Ch. 7) but, for example, the theory of time suggested by Evans (see especially 11.2.17) as well.

The hypothetical framework of hierarchical processing developed here thus allows us to approach the root of the classical time problem (see 3.12) by distinguishing clearly between the traditionally confused levels of pretemporal (divisible) continuity applied to chaos by means of endogenous rhythmization, on the one hand, and temporal continuity (‘moving time’), on the other, viz., by treating the latter as the outcome of a superficial metaphor operating upon synthesized event structure after it has been discriminated in chaos by discontinuation, first by provisional metonymic partitioning, then by temporal analysis/discontinuation proper (see 3.8–11, 3.13, 3.16). Again, time is discontinuous in its analytical essence. Without this insight there appears to be no solution to the Time Problem (cf. 3.12). These assumptions also constitute the theoretical basis for the solution of the perennial enigma of Zeno’s paradoxes proposed above (4.6.4).

The present framework offers an explicit hypothesis of deriving time from space (and motion) that consistently ascribes to aspect the pivotal role of temporal instrument, viz., as transitional (compound) spatial-temporal
perspective (see 2.1–4, 3.16, 4.6.4.2, 4.6.8, 5.6, 8.3–4). The perspectival nature of time (neglected traditionally; see, for example, 11.2.3, 11.2.6, 11.2.10, 11.2.12) derives naturally from its spatial origin and the cognitive-pragmatic condition that the analysis of things and their motion is always dependent on the subjective perspective of the observer. Spatial and temporal, as well as spatial/temporal, perspective constitutes, by its closeness to perceptual-sensory analysis, the basis for the elaborate and systematic functioning of perspective on all levels of teleology-driven cognitive-pragmatic processing, integrated in permanent selection according to actual and previous experience, emotions, values, needs, intentions, expectations, and so forth (cf. 3.2).

One natural consequence of the holistic-coherent understanding conveyed by the model of perceptual-actional abduction (see 3.2, 3.13) is that the resulting conception of time ascribes a central role not to the surface-related, chronological functions of fixing (‘dating’), dividing, or measuring time but to the functions sometimes referred to as timing, i.e., those related to the cognitive coordination of perception and action by a subject precisely on the basis of spatial/temporal, i.e., aspectual-perspectival analysis (see 3.3). Such coordination pertains both to such ‘simple’ activities of everyday life as motion and speech and, notoriously, to artistic performances of, for example, a piece of music, a song, or a part in a play.

The hierarchical-processual model also allows us to differentiate between deep structure functions and surface structure functions associated with the ‘before-after’ distinction. On the one hand, it has been ascribed a hypothetical role in the ontogenetic development of aspect (reflected also by permanent cause-effect analysis), and, on the other, its surface-related application is foreseen in the synchrony of tense-taxis cooperation, viz., in terms of anteriority vs. posteriority subordinate to tense meanings (see 3.16, 4.2, 4.5, Ch. 7, 8.3, Ch. 9).

The holistic and coherent nature of time processing suggested by the abductive model has enabled new approaches to classical problems of time and to problems not recognized until now as temporal. Besides Zeno’s paradoxes, I have discussed above Heraclitus’ famous assertion about our stepping/not stepping into the same river and explained the implicit contradiction as the result of confusing two distinct temporal perspectives (see 4.6.1). I could add here the paradox of ‘the chicken and the egg’, a paradox that dissolves in a trivial way as soon as we introduce two distinct situational-temporal perspectives on the cause-effect relationship of the implicit event, viz., holding for a definite chicken in a temporally defined situation vs. an indefinite chicken in a temporally indefinite situation (of general background). Only chickens ‘in general’ can be viewed as either preceding or succeeding an egg. The paradox arises through the confusion of the two perspectives.
The holistic-coherent model of time processing has been demonstrated to offer a hierarchical ordering of the temporal categories of aspect and tense, as well as the inclusion of the further category of taxis as dependent on the former two. This is the theoretical background of the proposals in regard to the traditionally controversial status of the perfect (system of perfect meanings) suggested above (Ch. 9).

Within the same framework new conditions have been created for a novel treatment of, for example, the temporal conjunctions in a 'non-aspect language' such as German, which discloses underlyingaspectual distinctions and, hypothetically, their universal cognitive-semantic nature (Ch. 10).

A theory of time based on the primacy of aspect can be shown to suggest a simple solution to the 'eternal' problem posited in philosophical, linguistic, and physical treatments of time by the allegedly 'exceptional' nature of the present (see 3.12, 3.16, 4.2, 4.6.6, 4.8, 8.2.3, 8.6). The traditionally unexplainable irreconcilability of the present with the measurement of time, or, correspondingly, with the time-related ('actual') use of English simple forms, turns out to be primarily not a matter of tense but of aspect. The partial aspectual view typical of the actual present meaning naturally does not permit either measurement of extension or the opposite aspectual feature of a total view expressed by simple forms.

Besides the partial aspectual use of English 'continuous' forms in standard cases of close background and embedded foreground (addressed at some length in the above presentation; see 3.12), as well as in expressions of future time (not treated here), it should be recognized that there is a vast field for future research in the additional use of these forms in cases where it should not be expected prima facie, i.e., with (a) stative meanings and (b) meanings of habituality-iterativity. Such cases have been treated in merely tentative ways (Thelin 1990a: 47ff., 73; 1991b: 283ff.) and deserve to be examined more systematically so as to clarify the extent to which they can be integrated with the present framework or require its future modification.

The hypothetical model of time’s derivation from space and motion suggested above – on the basis of a theory of aspect as a compound or transitional spatial/temporal category – is naturally open to empirical corrections. Hopefully, it will enable a number of further substantial questions concerning the nature of time to be raised. I have pointed to the necessity of examining the possible correlations of temporal analysis with the neurobiological processes involved in event perception, primarily the working of endogenous rhythmization, but possibly also with processes beyond it (see 3.3, 3.11).

It would be encouraging if the hierarchical-processual structure of the proposed model could stimulate more incisive research on the ontogeny of space and time, more specifically on the child’s successive acquisition of space and time orientation and its corresponding linguistic implementation. Such research obviously presupposes the concomitant attention to the essence of change-of-state and cause-effect analysis, as well as a critical as-
essment of the perceptual-cognitive reality of the corresponding distinctions of situation analysis assumed until now in terms of foreground, close background, and remote background (see 2.3, 3.8, 3.12, 3.16, 4.2–3, 4.8, 5.5–7, Ch. 7, 8.1, 8.4, Ch. 9, Ch. 10, 11.2.6, 11.2.10, 11.2.12). In particular, it is the background concept that appears to be in need of further elaboration (cf. Thelin 1990a: 65ff., 77).

The above discussion of the interrelations of Gestalt perception and the aspectual-temporal perspective on events (and situations) is conceived as a first approximation that hopefully merits being extended (see 3.8–9, 3.13, 3.16). In this connection it is surprising to find support not only for the role of metaphor suggested by me in the primordial derivation of time from space and motion, but also for metonymy, viz., on the hierarchically prior level of perceptual-sensory processing by way of chunk-wise selection (see 3.8). This finding, which is in agreement with Shapiro & Shapiro’s (1988: 34) hierarchical ordering, also suggests a further path of research in the light of temporal-perspectival theory.

Another central issue, already raised by Kantian a priori, concerns the possible innateness of temporal processing. Since our only access to the meanings of time is language, it is natural that this issue should be considered in connection with the universality discussion in linguistics. It is to be expected that a coherent hierarchical-processual model, tracing time back to pretemporal continuity effected by biological rhythmization and its partitioning by perceptual-sensory chunk-wise selection and, subsequently, the derivation and application of temporal perspective as a further means of discontinuation (cf. 3.9), offers a more transparent, and thereby also more easily falsifiable, framework for corresponding hypotheses than is traditionally available. Within it we should be in a better position to pose questions about possible perceptual-cognitive innateness, linguistic universality, and cross-linguistic or language-typological properties of time, specifically in relation to the assumed hierarchical levels.

The condition that Kantian a priori can be replaced by a hypothetical, coherent derivation of time from space and motion already indicates that the involved processes need not be innate, i.e., part of human phylogeny, but might rather be viewed as part of ontogeny and synchrony. Such an assumption would allow us to understand the innateness of time to pertain merely to its perceptual-cognitive preconditions in the shape of biological rhythmization and to the general strategies applied to the latter such as metonymy and metaphor (analogy), attested to by chunk-wise selection (interacting with Gestalt perception; cf. 2.2, 3.8., 3.15) and the procedure of time construction, respectively. Accordingly, we would not be entitled to speak of the temporal categories of aspect, tense, and taxis as innate in essence. It would be possible, however, to assume that the phylogenetic preconditions for each of the three categories and, accordingly, the preconditions for their linguistic universality, are different. In agreement with this reasoning it would appear
feasible to assume that the distinctions ascribed to the category of aspect, i.e., totality vs. partiality and foreground vs. background, are cognitive-semantic reflexes of the presumably innate perceptual-sensory Gestalt distinctions parts vs. wholes and figure vs. ground, and thus to indicate a considerable probability of the universality of this category (irrespective of its language-specific implementation). Such a dynamic understanding might be applied more generally to the issue of innateness raised by Chomsky with regard to grammatical structure and his corresponding controversy with Piaget on this issue (see 2.2, 3.15). With respect to time specifically, Piaget rejected Kant’s a priori conception (Piaget 1946: 293) and advocated instead a fruitful ontogenetic-constructive (operational) view. Unfortunately his studies of time in the child suffered from his restricted view of time as ”a coordination of movements of different speeds” (ibid.: 269; cf. also Piaget and Inhelder 1969: 107–109).

To what extent equivalent conditions can be determined for the universality discussion with regard to tense and taxis is a question in need of further research (see 4.2, 4.5, 4.6.8, 4.8, Ch. 7, 8.4.7–9). So far it appears that the tense category, based on the presumably universal awareness of an actual moment of speech/observation (not innate but acquired ontogenetically), allows of language-specific (or typological) differences with regard to the predominance of either spatial (directional) or temporal correlations of events. As to taxis, we have to make a distinction between its application to tense (Ch. 9), on the one hand, and, on the other, its independent (syntactic) use to express the primary temporal distinction ’before-after’ that is intimately associated with cause-effect analysis (see 3.16, 4.5, Ch. 7, 8.3) and, thus, assumed to be preprogrammed genetically in its basic strategic workings. In the former case taxis will be subject to the same restrictions in regard to universality as tense; in the latter case its assumed phylogenetic origin would indicate universality.

In this connection, one would expect the explicitly hierarchical-processual model to offer a favourable background for posing more incisive questions about the ontogenetic order in which temporal categories and their various components are acquired by children, especially with regard to aspect and tense (see 2.2). For example, the interrelations of memory and time (see 2.3, 3.15), in their successive cognitive emergence, suggest themselves as a challenging field of further research. The role of aspectual analysis for the memorization and retrieval of past events and situations by means of long-term (’episodic’) memory may, on the present analysis, be expected to be more basic than temporal functions of measurement and dating (Ch. 7). However, we still lack knowledge about the neurocognitive mechanisms involved, both in general and in regard to the particular aspectual distinctions posited by the theory. In the light of biopragmatism and its close association of perception and action (see 3.2) it becomes a natural issue to also examine the extent and ways in which the role of time in the perception of events and situations –
beyond general ontogeny – is subject to variations related to sex, age, and disease (see 3.11). However, the overriding question in this connection is, apparently, the general role of time in the central strategy of imagery mediating between sensorimotor functions and a logic of action, including language (see 2.2, 3.15).

The hierarchical-processual interrelations of time (temporal-perspectival analysis) with change-of-state and cause-effect analysis constitute a complex issue of great significance, which is addressed only in outline in my presentation above (see, for example, 3.10). The further progress of temporal theory no doubt presupposes a broad interdisciplinary cooperation between philosophers, linguists, anthropologists, cognitive scientists, neuropsychologists, and neurobiologists dedicated to investigations of human action in a dynamic interplay with perception and cognition. One of the particular problems pointed to above as a challenge to future research is the complicated picture presented by the interrelations of aspectual analysis and interpretations of change-of-state and cause-effect in linguistic decoding (cf. 3.13).

The proposed model of time and its foundation on the primacy of aspectual-perspectival analysis have been demonstrated to harmonize in non-trivial ways with Peirce’s semeiotic, more specifically with his distinction between symbol and index, as well as his trichotomy of universal categories called Firstness, Secondness and Thirdness (see 4.7–8, Ch. 5). These findings might be of significance – beyond aspectology and temporal studies – for the further cognitive-pragmatic foundation of linguistics and the philosophy of language.

One of the problems that may hopefully be approached afresh with the aid of the proposed model is the apparent irreconcilability of time conceived as a constituent of physical doctrine, on the one hand, and as a human cognitive construction, on the other. Time, eventually, appears to be ripe for treatments in an unreserved dialogue between the natural sciences and the humanities in the spirit foreseen by Habermas’ New Paradigm (see 1.1, 2.5). This presumption I would base also on Lorenz’s insightful prediction that the natural sciences, by studying man and especially the human nervous system, would learn to regard experience and knowledge as organic functions (cf. 2.1). It is also in perfect agreement with Bohr’s view that “[A]ll account of physical experience is, of course, ultimately based on common language, adapted to orientation in our surroundings and to tracing relationships between cause and effect” (3.12). Such a dialogue could not possibly avoid the question how apparently irreconcilable conceptions of time can be derived in coherent and logically consistent ways from the workings of one human mind (cf. 4.8).

The philosophical framework that has emerged from my engagement with time and, in a process of feedback, has guided its successive development toward the present model is understood as biologically founded cognitive-pragmatic realism or, simply, biopragmatism (see 1.20, 3.1). A decisive con-
stitutive role in this philosophical framework is ascribed to perspectivism (see 2.5, 3.2, 3.9). Time as a human construction for the perspectival analysis (manipulation) of events and situations is a weighty argument against all objectivist kinds of direct or ‘naive’ realism (cf. 1.9). Perspective, according to the present theory, operates on all levels of actional and perceptual-cognitive *abduction*, understood by Peirce to be the very logic of pragmatism (see 3.1–2, 3.7, 3.13, 3.16). Biopragmatism, accordingly, is conceived as representing an abductive or, more precisely, perspectival-abductive kind of realism (cf. 1.4) – given the meaningfulness of maintaining the philosophical concept of realism at all (see 1.5, 1.8).

In agreement with Peirce’s principle of fallibilism (cf. 1.4) and Popper’s theory of error elimination (cf. 1.8), I urge the reader to regard my above proposals merely as signs of transitional stages in a permanent scientific-interpretative process of interacting analysis-synthesis. In the light of new empirical evidence these proposals are prone to exhibit their inherent imperfections, incongruities, and deficiencies. From this perspective, my efforts will have been worthwhile even if the questions raised should turn out to lead to future temporal research in quite different directions.
The following abbreviations refer to the standard editions of Charles S. Peirce’s work:


Faye, Jan. MS. *A Propedeutic to the Metaphysics of Tense*.


Tomaševskij, Boris V. 1928. Teorija literature. 4-e izdanie. Moskva: Gosudarstvennoe izdatel'stvo.


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8. Леннарт Лённгрен (Lennart Lönngrén): Употребление краткой формы страдательного причастия прошедшего времени в современном русском языке. (With a Summary in English: The Use of the Short Form of the Past Passive Participle in Modern Russian.) 1970.
19. Леннарт Лённгрен (Lennart Lönngrén): Русские деривационные суффиксы. (With a Summary in English: Russian Derivational Suffixes.) 1978


34. Тамара Лённгрен (Tamara Lönngrén): Лексика русских старообрядческих говоров (на материале, собранном в Латгалии и на Житомирщине). (With a Summary in English: The Lexicon of Russian Old-Believers [based on Material from Latgale and the Žitomir Area].) 1994.


47. Никита Михайлов (Nikita Mikhaylov): Творительный падеж в русском языке XVIII века. (With a Summary in English: The Instrumental Case in Eighteenth-Century Russian.) 2012.