I. Systematik
Systematics

1. Semiotics and its presentation in this Handbook

1. Eight theses on the tasks of semiotics

The present Handbook offers a comprehensive survey of contemporary knowledge and methods of research in semiotics. It is the result of a decade of cooperation between scholars in the humanities, social sciences, natural sciences and sciences of engineering. As a basis for their work, all contributors accepted eight theses on the task of semiotics and on the Handbook's objectives and procedures of production. These theses are intended to provide a guideline for the Handbook user as well.

1.1. The subject matter of semiotics

Semiotics is the study of signs. It thus investigates the structure and function of all events which involve signs: the processing of information in machines, the metabolism in organisms, the stimulus-response processes in plants and animals, the activities of perception and orientation in higher creatures, the interactions of primates, communication between humans, the dealings between social institutions, and the delicate processes of interpretation which take place in the comprehension of the complex sign structures in legal matters, in literature, music, and art.

Events which involve signs are called "sign processes" or "semioses". They occur only in living nature and in the cultures of higher animals. **Living nature** consists in the totality of all organisms, i.e., the purposive systems whose ways of behavior and body forms are passed on from one generation to the next through the genetic code; a **culture** can be conceived as a group of organisms whose ways of behavior are tied to a particular tradition, i.e., acquired by learning and passed on to the next generation after creative modification.

The two types of transmission (inheritance and tradition) are sign processes, and that which is transmitted (knowledge, attitudes, and skills in the production and use of artifacts) is, to a considerable extent, also based on signs.

The Handbook documents the current state of research into the sign-theoretic foundations of living nature and culture.

1.2. Theoretical, descriptive, and applied semiotics

Historically, semiotics has since Antiquity been geared towards solving everyday practical problems. Medical semiotics, already named so by the Greeks, helped physicians to recognize illnesses on the basis of their signs (symptoms). The art of divination practised by the Romans aimed at the prediction of future events through the interpretation of omens. Medieval heraldry regulated the de-

sign of coats of arms to enable knights to recognize each other. The cryptanalysis of the Baroque period made great efforts to decipher texts written in unknown characters and languages. The Enlightenment investigated those ways of presentation which could be expected to achieve desired effects in the various genres of the arts. Romantic philology attempted the attribution of historical documents to authors and epochs and tried to distinguish originals from copies. Craft and industry have always striven for the standardization and the legal protection of guild signs, corporate symbols, and, more recently, trademarks, a task for which institutions such as the International Standards Organization (ISO) now establish the guiding principles.

These tasks of **applied semiotics** could be accomplished all the better, the more knowledge was available regarding the differences in the functioning of the various types of signs and semioses. Thus, on the basis of precursors in Antiquity and the Middle Ages, a **descriptive and comparative semiotics** developed, which saw as its main goal the establishment of an increasingly comprehensive and differentiated classification of signs. Philosophy systematized the criteria applied in this classification, which eventually led to the development of **theoretical semiotics**. Its aim is to set up a system of operations for the analysis of signs as well as a system of basic terms and axioms from which theorems can be derived to explain and predict how the meaning of complex signs depends on their structure, on their domain of reference, and on the goals of their users.

In the Handbook equal attention is given to the results of theoretical, descriptive-comparative, and applied semiotics.

1.3. Semiotics as an object-science

Encouraged by the epochal developments in modern logic and linguistics, early twentieth-century theoretical semiotics set out to provide general concepts for all relevant types of signs and semioses. This intention brought it into competition with fields that had already established themselves as university disciplines and had developed their own independent approaches to the signs and semioses occurring in their subject matter; among the disciplines involved were biology, psychology, and medicine on the one hand and philology, musicology, and art history on the other. Semiotics responded to this challenge in two ways: (1) it concentrated on areas not

treated by more established disciplines — a tendency which led to the constitution of **regional semiotics** such as theater semiotics, film semiotics and the semiotics of nonverbal communication; (2) it made the subject areas of the individual disciplines accessible to a unified and precise description within its own conceptual framework. The advantages of the latter approach became particularly evident in the analysis of multi-media semioses in nature and culture. With regard to culture, it became possible — in opera, circus, and theater as well as in newspapers, magazines, films, and television — to identify the specific contribution of the various sign types to the overall effect, to weigh them against each other, and thus to create the preconditions for a rational choice of the most effective medium in each case.

The Handbook presents semiotics as an **object-science** which studies all types of sign processes, giving particular coverage to the fruitful interaction between semiotics and the sign-related academic disciplines.

1.4. Semiotics as a metascience

The advantages of the semiotic approach appear not only in its results but also in its methods. Since the disciplines which interpret cultural artifacts — among them anthropology, archeology, philology, musicology, and art history — have, after a common beginning, developed their procedures of analysis and description independently of each other, their methods seem to be quite dissimilar and incompatible. In contrast, the semiotic approach explores the possibilities of applying the same procedures of analysis and description to artifacts of all kinds. In this way, semiotics has given considerable impulses for the reconstruction of the methods of sign-related disciplines as well as of their concepts, axioms, and theorems on a common basis. The role of semiotics in the philosophy of science is not limited to those disciplines which study sign processes. The fact that all disciplines have to use certain methods of investigation and modes of presentation, and that both the investigation and the presentation of a subject involve sign processes, led to the claim that even the philosophy of science is essentially semiotics. Since the beginning of this century, when this claim was made, the institutionalized communication among scholars and scientists has been added as a further argument and area of investigation. In consequence, semiotics has been consti-

tuted not only as an object-science on the same level as the sign-related academic disciplines but also as a **metascience** which takes all academic disciplines as its domain, regardless of whether they themselves study sign processes (the humanities, the social sciences, biology, and medicine) or not (physics, chemistry, and astronomy).

The Handbook takes account of this development and considers the achievements and limits of semiotics as a metascience within the framework of the philosophy of science.

1.5. Semiotics as an interdisciplinary approach

Its multidisciplinary subject matter brought semiotics into competition with other **interdisciplinary approaches** − hermeneutics, gestalt theory, information theory, systems theory, etc. Each of these approaches was forced to justify its claims with respect to the individual disciplines and thus each has occasionally displayed a tendency to universalize its domain and to accuse competing approaches of being unscientific. This has been facilitated by the fact that most interdisciplinary approaches make implicit use of their mutual results, so that it is difficult to determine their systematic relationship to each other. Therefore, it remains to be clarified for each approach whether it is defined by a subject matter, a problem formulation, a method of investigation, or a mode of presentation, and how these relate to the subject matter, problem formulation, method of investigation, and mode of presentation in semiotics.

The Handbook shows that universalist claims from any side whatsoever are unjustified by explicitly analyzing the systematic relationship between semiotics and the other interdisciplinary approaches.

1.6. Current trends in semiotics

Universalist claims are also unjustified for the movements, schools of thought and traditions which compete within semiotics itself. Their differences at times appeared so irreconcilable that semioticians were advised to postpone their attempts at a reconstruction of the individual disciplines until they had put their own house in order. However, such advice has no justification, since all sciences are in a permanent process of change; if one wished to delay the application of their results until they came to a standstill, the application would be postponed indefinitely.

Moreover, the various movements within semiotics frequently place their emphasis and center of differentiation in quite different areas, so that they complement rather than contradict each other. This fact can be put to use in the systematic presentation of semiotics, provided a point is made of including alternative doctrines and of not covering up unresolved contradictions.

The Handbook documents all **trends currently active** within semiotics without giving up the attempt at a unified systematic presentation of semiotic theory, suitable for determining the relationship of semiotics to other interdisciplinary approaches as well as for reconstructing the individual disciplines.

1.7. Culture-specific sign conceptions

Semiotics has obtained impressive results in the last hundred years, thereby establishing itself in the academic world. So far, however, it has explicated only a fraction of the implicit knowledge of sign processes which sign users possess. Semioticians mostly know the history of their field less well than other scholars, and when they do turn to it they tend to give exclusive attention to individual figures or epochs. The great treasure of **sign conceptions** which has been accumulated in daily life, in the arts, and in the religions of earlier periods and of other cultures has generally lain fallow until quite recently. A description which does not systematically include all aspects of its subject must eventually default; however, no semiotician today can say with certainty that he or she is familiar with all relevant aspects of signs and semioses. It would therefore be wrong to yield to the decline in respect for common sense which has followed the rise of the natural and social sciences.

In addition to academic semiotics, the individual sign-related disciplines, and the interdisciplinary approaches, the Handbook gives an account of the diverse sign conceptions which in the course of history have been developed in everyday life, in the arts, and in the religions of European and non-European cultures.

1.8. Dialogical procedures in the presentation of semiotics

Academic semiotics and its relationship to the individual disciplines can no longer be covered in all its detail by any one person. The inclusion of the sign conceptions of different epochs and cultures renders such a

comprehensive coverage entirely impossible. A cooperative account, however, always runs the risk of heterogeneity in problem presentation and incompatibility in terminology. This problem arises especially in the systematic and discipline-reconstructing sections. On the other hand, the contributors to the Handbook were not to be dogmatically prescribed a "standard theory" of semiotics.

This is why the Handbook was **produced dialogically** in three steps: First, drafts of fundamental articles about the systematics and history of semiotics were written on the basis of the current state of the art. These were then made available to all contributors as working material so that they could suggest corrections, expansions, pertinent differentiations, or other modifications according to the requirements of their own articles. Only after these suggestions had been submitted did the original authors produce the final versions of their articles.

2. Syntactics, semantics, and pragmatics as branches of semiotics

As was pointed out in § 1.1., semiotics may be defined with respect to its subject matter, which is semiosis. Semiosis is an event in which something functions as a sign. Different semioticians distinguish different factors in semiosis (cf., e. g., the traditions of Peirce (1931−58, 1982 ff), Morris (1938, 1946, and 1964), and Carnap (1939, 1942, and 1954); of Saussure (1916 = 1968), Buyssens (1943), Hjelmslev (1943), and Prieto (1966); of Ogden and Richards (1923), Bühler (1934), and Jakobson (1960); and of Uexküll (1940)). However, all such structurings of semiosis involve at least three factors, whose interrelation is described by phrases such as: "A takes B to stand for C", "B refers to C for A", "A takes account of C in virtue of the presence of B", etc. We therefore stipulate that the following is a necessary and sufficient condition for something to be a semiosis:

(1) A interprets B as representing C.

In this relational characterization of semiosis, A is the interpreter, B is some object, property, relation, event, or state of affairs, and C is the meaning that A assigns to B. These factors are connected by the triadic relation:
… interprets − − − as representing .−.−.− .

The term "sign" can be used in two different ways with respect to this relation. While logic-oriented semioticians like Morris and Carnap use it as a term for B's, linguistics-oriented semioticians like Saussure and Hjelmslev use it as a term for pairs of B's and C's. The latter usage is justified by the fact that what meaning is assigned to some entity in a specific semiosis depends in part on properties of that entity. However, it also depends on properties of the interpreter: It is true for all three ranges of entities able to enter the three slots in the triadic relation that they are dependent on each other. In the rest of this article we will therefore use a separate term for each of the three factors and refer to A as an interpreter, to B as a sign, and to C as a meaning.

Because of the interdependence of the three factors it is not easy to devise a clearcut division of labor for the investigation of semiosis. Nevertheless, a tripartite division of semiotics is now generally accepted. It is usually defined with regard to the three factors of semiosis. The conditions an entity must fulfil to be able to represent meaning for interpreters in semiosis are the subject matter of **syntactics**. The conditions an entity must fulfil so that it can be represented by signs for interpreters in semiosis are the subject matter of **semantics**. The conditions an entity must fulfil to be able to interpret signs as representing meaning in semiosis are the subject matter of **pragmatics**.

The historical origins of these disciplines can be traced back to the *artes dicendi*, viz. grammar, rhetoric, and dialectic, the teaching of which was organized in the so-called *trivium* in medieval European schools from the ninth century A. D. onwards. Charles S. Peirce reinterpreted the *artes dicendi* as branches of "semeiotic" and systematized them as disciplines treating signs as Firstness, Secondness, and Thirdness, respectively. He distinguished between speculative grammar, critical logic − the successor of dialectic −, and methodeutic − the successor of rhetoric (Peirce, C.P. 1.191 ff and 2.93; cf. Savan 1988). It was Charles W. Morris (1938) who coined the terms "syntactics" and "pragmatics" and introduced the division of "semiotic" into syntactics, semantics, and pragmatics. Although this trichotomy is related to that of Peirce, its introduction was motivated differently: Morris tried to show that the objectives of three leading philosophical movements of his time, Logical Positivism, Empir-

icism, and Pragmatism, were not incompatible but complementary (cf. Morris 1929 and 1937), since Logical Positivism studied the formal structures of the languages of science, Empiricism studied the objects of research and their relations to the languages of science, and Pragmatism studied the procedures and conventions governing communication among scientists. Thus, for Morris, syntactics could utilize the methods and results of Logical Syntax developed by the Logical Positivists (cf. Carnap 1934), while semantics and pragmatics could proceed from the analytical achievements of Empiricism and Pragmatism, respectively.

Terminologically, Morris could build on Bréal, who had introduced "semantics" as the "the science of significations" (1897), which suggested parallel structures for the names of the other two branches of semiotics, "syntactics" and "pragmatics". It was this parallelism that later also led to the transformation of the terms "semeiotic" (Peirce) and "semiotic" (Morris and Carnap) to "semiotics", which was publicly introduced by Margaret Mead on May 19, 1962, to include "the study of all patterned communication in all modalities" (cf. Sebeok 1971: 9).

Despite the general acceptance of the terminology, the theoretical status, the delimitations, and the subdivisions of the three branches of semiotics are still controversial today. The Morris of the *International Encyclopedia of Unified Science* (Neurath 1938 ff) treats the three branches in a parallel way (cf. Posner 1986: 566 f). He isolates the three factors of semiosis and specifies the subject matter of each semiotic discipline on the basis of a dyadic relation between one of the factors and the sign: Syntactics studies signs in relation to other signs (B in relation to B), semantics studies signs in relation to meanings (B in relation to C), and pragmatics studies signs in relation to interpreters (B in relation to A). Since these three definitions do not cover all aspects of semiosis (e. g., the triadic relation between A, B, and C) and of semiotics (e. g., the problem of the interrelation of the three semiotic disciplines), all remaining aspects are said to fall under semiotics proper (cf. Fig. 1.1).

In this conception pragmatics cannot treat much of the relation between signs and interpreters without including meanings, i. e., without becoming semiotics proper. This and other criticisms made Morris give up the parallel conception of the three branches in fa-
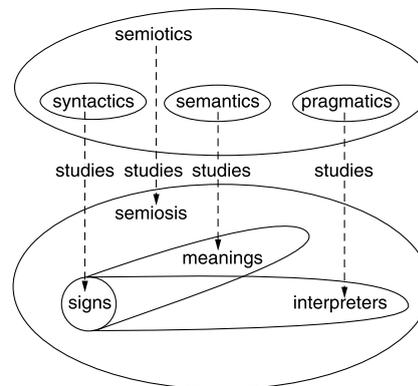

Fig. 1.1: The three factors of semiosis and the three branches of semiotics according to the early Morris (1939: 133 = 1971: 417).

vor of a hierarchical one proposed by Carnap (1942: 9): "If we are analyzing a language, then we are concerned, of course, with expressions. But we need not necessarily also deal with speakers and designata. Although these factors are present whenever language is used, we may abstract from one or both of them in what we intend to say about the language in question. Accordingly we distinguish three fields of investigation of languages. If in an investigation explicit reference is made to the speaker, or, to put it in more general terms, to the user of a language, then we assign it to the field of pragmatics. (Whether in this case reference to designata is made or not makes no difference for this classification.) If we abstract from the user of the language and analyze only the expressions and their designata, we are in the field of semantics. And if, finally, we abstract from the designata also and analyze only the relations between the expressions, we are in (logical) syntax. The whole science of language, consisting of the three parts mentioned, is called semiotic."

As Morris emphasized (1946: 218 f = 1971: 302, cf. 1938: 16 = 1971: 30 f), this exposition can be adopted if it is generalized in a number of aspects: 1. Semiotics not only deals with linguistic expressions but with all kinds of signs; therefore "language" has to be replaced by "sign system". 2. Pragmatics not only has to do with users and uses of signs in the sciences but with all kinds of sign users and sign uses. 3. Semantics does not only treat the designative mode of signification but all ways of representing meaning and all kinds of meaning. 4. Syntactics not only comprises the logical syntax of the languages
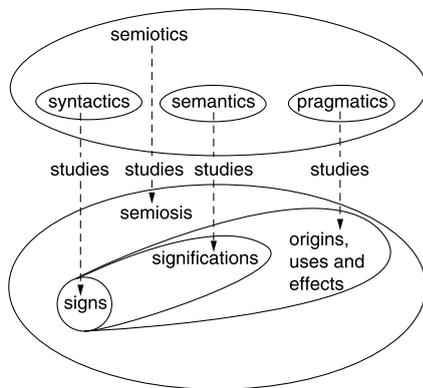
Fig. 1.2: The three factors of semiosis and the three branches of semiotics according to the later Morris (1946: 352 ff = 1971: 365 ff).

of science but is much wider: it also includes (a) phonology and morphology of the languages of science, (b) phonology, morphology, and syntax of other languages, and (c) the analysis of the formal aspects of non-linguistic sign systems.

The results of this generalization was formulated by Morris in the glossary of his 1946 book (1946: 352 ff = 1971: 365 ff): Pragmatics is "that branch of semiotic which studies the origin, the uses, and the effects of signs". Semantics is "that branch of semiotic which studies the signification of signs". Syntactics is "that branch of semiotic that studies the way in which signs of various classes are combined to form compound signs. It abstracts from the signification of the signs it studies and from their uses and effects [...]" (cf. Fig. 1.2). Whereas Carnap had made syntactics seem to be the basis of all semiotic studies in 1934 and Morris had treated syntactics, semantics, and pragmatics as relatively independent of each other in 1938, they later tended to see syntactics as embedded in semantics and semantics as embedded in pragmatics (cf. Carnap 1939: 16, cf. also Cherry 1957: 219 ff).

This and the fact that Morris (1946) avoids speaking of abstraction in his characterization of pragmatics (and semantics!) have led some of his exegetes to speak of "Morris's pragmatically unified semiotics" (cf. Apel 1973) and to advocate the identification of semiotics with pragmatics. However, this would substitute a maximalist conception for the minimalist conception of pragmatics in Morris 1938 and was clearly not the intention of Morris or Carnap at any time of their lives (cf. Posner 1979 = 1987: 49 f note 20).

The opposite type of misunderstanding consisted in hypostatizing the subject matter of syntactics, semantics, and pragmatics by postulating the independent existence of "syntactic signs", "semantic signs", and "pragmatic signs", respectively (cf., e. g., Reichenbach 1947: 318 ff). In this way, three perspectives of scientific investigation were reified as three types of objects in the domain of investigation. However, there are no signs that are exclusively syntactic or exclusively semantic or exclusively pragmatic. Where there is a sign, there must also be a meaning and an interpreter for a semiosis to take place. Thus every sign and every semiosis, by definition, have all three dimensions, and they can only be fully understood if studied from a syntactic and a semantic as well as a pragmatic point of view.

It was Otto Neurath, the general editor of the *International Encyclopedia of Unified Science*, who warned that the Morrisian triads might engender pseudo-problems. And Morris himself admitted in 1946: "The course of events has proved in part the legitimacy of [such] [...] fears. Yet these terms, if carefully introduced, serve to mark the scope and subdivisions of semiotic. [...] in general it is more important to keep in mind the field of semiotic as a whole, and to bring to bear upon specific problems all that is relevant to their solution" (Morris 1946: 217 ff = 1971: 301 ff).

Morris's scientific ethos can best be summarized by the following quotation from his main work on semiotics: "[...] sign-behavior, as formulated in the present account, lends itself to treatment within the categories of a general theory of behavior. Vague speculation on these matters is no longer necessary; the problems of sign-behavior have already reached the stage of empirical formulation and possible experimental resolution" (1946: 58 f = 1971: 134).

Although the once dominant behaviorist epistemology has lost much of its former attraction, the trend towards empirical formulations and experimental solutions has continued in the last half century. This becomes evident in each chapter of the present Handbook, the contents of which are set out in what follows.

3.   The structure of semiotics as presented in the Handbook

As is shown in the table of contents, the Handbook is composed of **sixteen chapters**, arranged in **six parts**. Volume 1 contains

Part A (Chapters I−IV) and the first Chapters (V−VIII) of Part B. Volume 2 contains the remaining Chapters (IX−XI) of Part B as well as Part C (Chapter XII). Volume 3 contains Part D (Chapters XIII and XIV), Part E (Chapter XV) and Part F (Chapter XVI).

3.1. Part A: Theoretical foundations

Part A (Chapters I−IV) presents a theory-based outline of the entire field of semiotics. This unique reference work includes chapters on the systematics (I), subject matter (II and III), and methods (IV) of semiotics.

Chapter I takes the division of semiotics into the three branches of syntactics, semantics and pragmatics as its basis. As postulated in § 2., "Syntactics" (Article 2) studies the conditions an entity must fulfil so that it can be taken by an interpreter to represent something. The article deals with the signifier, i. e., it covers the formal aspects of signs, their relations to other signs, and the way in which signs are combined to form complex signs. This includes the principles of the construction of texts, pieces of music, pictures, sculptures, industrial products, buildings, gardens, and cities, insofar as they represent something; in particular, the syntax, morphology, and phonology of natural languages fall under syntactics in ways specified in the article. "Semantics" (Article 3) studies the conditions an entity must fulfil so that another can be taken to represent it for an interpreter. The article deals with the signified and, in particular, with the conventional meaning of signs. It analyzes the rules for truth and denotation, as well as implication and its operationalization by means of semantic models. "Pragmatics" (Article 4) studies the conditions an entity must fulfil so that it can interpret something as a representation of something. The article deals with the sign users and with the circumstances of sign use in communication as well as in other types of semiosis.

These articles, together with the introductory articles of Chapters II, III, V, and XIV provide the theoretical and terminological foundation on which all subsequent articles are based. This is why they were made available in a preliminary draft to all contributors within the dialogical production process of the Handbook characterized in § 1.8.

While Chapter I deals with the structuring of semiotics, **Chapter II** deals with the structuring of its subject, semiosis. As Article 5, "Models of Semiosis", shows, a large number of competing graphic representations for the structuring of sign processes has been developed. What is called for here is critical comparison leading to viable definitions of the basic concepts for the analysis of sign processes. When an organism or a machine takes an object as a representation of another object, it must have a "channel" of access to it; to interpret the representation, it may use a "code"; and the entire process will take place in a biological, social, or technical "medium". Articles 6−11 examine the capacity of "optic", "acoustic", "tactile", "chemical", "electric and magnetic", and "thermal" channels; Article 12, "The Organization of Eye Movements", presents a case study of the combined use of several channels, and Article 13, "Body Behavior as Multichannel Semiosis", investigates general ways of enhancing the effectivity of semiosis in human communication through the simultaneous utilization of more than one channel. Article 14, "Technical Media in Semiosis", and Article 15, "Social Media of Semiosis", treat the additional possibilities and constraints imposed on semiosis by technical instruments and social institutions. Article 16 analyzes the concept of "Codes" and discusses its applicability in various channels and media, while Article 17 deals with the principles of code formation and "Code Change".

Chapter III considers the subject of semiotics from the aspect of evolution. As outlined in Article 18, "The Evolution of Semiosis", and Article 19, "Biosemiosis", sign processes have not always existed in the course of the development of the universe. They originated together with the development of life. Accordingly, the subsequent articles, 19−25, characterize the sign processes typical of the most important species of organisms, following the order of their genesis: the metabolism of unicellular forms ("Microsemiosis"), the sign processes connecting the organs within an organism ("Endosemiosis"), the parasitic processes in which fungi involve their host organisms ("Mycosemiosis"), the stimulus and response patterns in the life of plants ("Phytosemiosis"), the interactions of animals ("Zoosemiosis"), and the additional types of semiosis developed by humans ("Anthroposemiosis"). Also included in this series are sign processes of the most recent kind ("Machine Semiosis", Article 26), which were introduced with the invention of sign-processing machinery (measuring apparatus, automata, computers, and robots). The clos-

ing article of this section, "Environmental Semiosis" (Article 27), has a summarizing function: it shows how the sign processes of the various species and machines interact, thus determining their coevolution.

How does semiotics investigate, describe, and explain the many aspects of its subject? This question is answered in **Chapter IV**. After the introductory Article 28 on "Methodological Problems of Semiotics", Article 29 presents the ways of dealing with "Data and Hypotheses in Semiotics"; it covers laboratory experiments, tests, interviews, field work, naturalist observation, as well as the analysis of artifacts, tools and texts. In Article 30, the principles of "Theory Formation in Semiotics" are discussed, with particular emphasis on the theory structures appropriate for its various branches. Article 31 examines the application of semiotic theories in "Understanding, Explanation, and Action", with special reference to the humanities and the social sciences.

3.2. Part B: History of semiotics

Part B (Chapters V−XI) complements the systematic presentation of semiotics as a science, given in Part A, with a unique survey of the semiotic thought implicit in the use of signs in the various cultures of the world and in the historical epochs of the West. It is arranged in seven chapters according to chronological and geographical principles, although a point is made of not allowing the borders between the epochal and geographic areas to obscure the overall developments in semiotic thought.

Chapter V offers a general outline of decisive stages within "The Development of Sign Conceptions in the Evolution of Human Cultures" (Article 32) and then focusses on the principal historical changes that took place in the sign conceptions of the West. Since this topic cannot be treated without a discussion of methodological questions, the following three articles are titled "Problems in the Explication of Western Sign Conceptions" (Article 33), "History and Historiography of Semiotics" (Article 34), and "The Beginnings of Scientific Semiotics" (Article 35). In addition to discussing the general problems announced in their titles, Articles 32−35 also serve to introduce the reader, by means of ample cross-references, to the ensuing Chapters VI−X, "History of Western Semiotics", XI, "History of Non-Western Semiotics", and XII, "Current Trends in Semiotics".

The sign conceptions of Europeans in the Greek and Latin traditions, including the Jewish and Christian world-views, cannot be adequately described without an understanding of preceding and simultaneous developments in the Ancient Middle East and in the cultures of the Celts, the ancient Germanic peoples, and the Ancient Slavs. Therefore, the presentation of Western semiotics in the Handbook begins with **Chapter VI**, which treats sign conceptions in "Celtic Antiquity" (Article 36), "Germanic Antiquity" (Article 37), and "Slavic Antiquity" (Article 38), and is complemented in Chapter XI with "Sign Conceptions in the Ancient Middle East" (Article 89) as well as "Sign Conceptions in the Islamic World" (Article 90).

Chapter VII covers "Ancient Greece and Rome" as the second period in the "History of Western Semiotics". The introductory Article 39, "Sign Conceptions in Pre-Classical Greece", analyzes the lexical field of the ancient Greek words for signs documented in Pre-Classical Greek literature, and derives, on that basis, the conceptions the Greeks had of sign processes. Since it is practically impossible for any one person to describe, even for one single epoch, all semiotically relevant aspects with equal thoroughness, the remaining Articles in this chapter and in **Chapter VIII**, "The Middle Ages", **IX**, "From the Renaissance to the Early 19th Century", and **X**, "From the 19th Century to the Present", are organized in parallel subsections. Article 40 deals with "Sign Conceptions in Philosophy in Ancient Greece and Rome", Article 49 with "Sign Conceptions in Philosophy in the Latin Middle Ages", Article 62 with "Sign Conceptions in General Philosophy from the Renaissance to the Early 19th Century", and Article 74 with "Sign Conceptions in General Philosophy from the 19th Century to the Present". So, anyone wishing to study the development of sign conceptions within European and American philosophy as a whole can read articles 40, 49, 62, and 74 consecutively as one longitudinal section of Western cultural history. It should be noted, however, that until the Middle Ages only "Philosophy" is mentioned and that afterwards the term "General Philosophy" is used, which draws attention to the fact that, since the Middle Ages, aesthetics (Article 50) and logic (Article 52) − and since the Renaissance, aesthetics (Articles 63 and 75), logic (Articles 64 and 76), and philosophy of language (Articles 65 and 77) − have been separated and are

treated independently. A second longitudinal section of Western cultural history is formed by the articles on sign conceptions in the mathematics of Antiquity (Article 41), of the Middle Ages (Article 51), from the Renaissance to the early 19th century (Article 66), and from the 19th century to the present (Article 78). Additional longitudinal sections include music (Articles 43, 54, 68, and 81), architecture and the fine arts (Articles 44, 55, 69, and 82), medicine (Articles 45, 56, 70, and 83), and religion (Articles 47, 58, 72, and 87). As knowledge of languages on the one hand and of both human and non-human nature on the other has increased enormously since the 19th century, the relevant articles for this period have again been subdivided. The "Sign Conceptions in Grammar, Rhetoric, and Poetics", which are treated together for Antiquity in Article 42, for the Middle Ages in Article 53, and for the period from the Renaissance to the early 19th century in Article 67, are covered by two articles from the 19th century to the present: one on "Sign Conceptions in Grammar" (Article 79) and the other on "Sign Conceptions in Rhetoric, Stylistics, and Poetics" (Article 80). Similarly, the articles on "Sign Conceptions in Natural History and Natural Philosophy in Antiquity" (Article 46), in the Middle Ages (Article 57), and in the period from the Renaissance to the 19th century (Article 71) are continued by three articles for the period from the 19th century to the present: on sign conceptions in physics (Article 84), in biology (Article 85), and in economy (Article 86), respectively. Unfortunately, articles on historical sign conceptions in chemistry, psychology, and sociology, which had also been planned for the Handbook, did not materialize. The interested reader can find relevant information in the corresponding metadisciplinary articles of Chapter XIV on the semiotic aspects of chemistry (Article 135), psychology (Article 141), and sociology (Article 142). The historical chapters of the Handbook each conclude with an article which analyzes the sign conceptions in everyday life at that time (Articles 48, 59, 73, and 88).

Since most of the articles on sign conceptions in the "History of Western Semiotics" concentrate on Romanized cultures and on Christian world-views, they are complemented by two articles giving special attention to sign conceptions in the Byzantine east (Article 60) and to sign conceptions developed in the Jewish Middle Ages (Article 61).

With these two articles, Volume 1 of the Handbook ends, letting Volume 2 continue the historical Part B with Chapter IX, "From the Renaissance to the Early 19th Century", and Chapter X, "From the 19th Century to the Present".

A history of culture which traces the development of a question that is studied in a modern academic discipline would normally be written with exclusive attention to the European developments. In a history of semiotics, however, it is indispensable to provide access also to the sign conceptions of non-European cultures, which have reached remarkable complexity and elaboration in religion, in the arts, and in everyday life. This is attempted in **Chapter XI**, "History of Non-Western Semiotics". In its organization historical and geographical criteria have been combined for practical reasons. Articles 89, "Sign Conceptions in the Ancient Middle East", and 90, "Sign Conceptions in the Islamic World", are followed by contributions that examine each geographical region with respect to the sign conceptions developed in it throughout its entire history: Non-Islamic Africa (Article 91), India (Article 92), China (Article 93), Korea (Article 94), Japan (Article 95), the Philippines and Indonesia (Article 96), continental South East Asia, including Thailand, Laos, Campuchea, and Vietnam (Article 97), Oceania, including Polynesia, Micronesia, Melanesia, New Guinea and Australia (Article 98) as well as the pre-Columbian Americas (Article 99).

3.3. Part C: Contemporary semiotics

Part C (Chapter XII) characterizes the various trends currently active within semiotics. Each article deals with another trend; it is not primarily concerned with the biography of its leading authors, nor with the immanent interpretation of their works; it rather presents the most important questions, concepts, methods, and results of the trend within its historical context, using the conceptual apparatus developed in Chapter I of the Handbook. The main attention is focussed on historical controversies insofar as they have become relevant for modern semiotics. Precursors and successors of the movement concerned are included, as are researchers who, although they may not have been in actual contact with it, nevertheless had systematically related goals. Since many current semiotic movements have resulted from developments in the individual disciplines of the last

two centuries, there are many connections between the articles of this section and those of Chapters X as well as XIV.

In **Chapter XII**, movements which proceeded simultaneously or in close interaction with each other are treated in neighboring articles. The opening articles deal with the currently dominant schools of Peirce (100) and Saussure (101), who had formulated explicit programs for the construction of a theory of signs. The following articles cover movements which made significant contributions to the realization of these programs: the "Logical Analysis of Language" of Frege and his successors Russell, Carnap, Church, Dummett, and others (Article 102), "Phenomenological Semiotics", founded by Brentano, Meinong, and Husserl (Article 103), the "Signific Movement", supported by the mathematicians Mannoury and Brouwer (Article 104), linguistically oriented "Semasiology and Onomasiology" (Article 105), the "Logical Empiricism", originating in the Philosophy of Science of the Vienna and Berlin Circles and the Warsaw/Lwow School (Article 106), the Euro-American philosophical "Constructivism" with the related movements of intuitionism and operationalism (Article 107), the theory of action called "Praxeology" by Kotarbińsky (Article 108), Wittgenstein's "Ordinary Language Philosophy" (Article 109), von Uexküll's "Umweltlehre" with its repercussions in modern ethology and sociobiology (Article 110), the semiotics of culture developed by Cassirer and his successors (Article 111), the "Sematology" of Bühler which has become influential mainly in continental European psychology (Article 112), and the "Symbolic Interactionism" of G. H. Mead, C. W. Morris, and their successors (Article 113). These semiotic movements were joined, early in this century, by literature- and culture-oriented "Russian Formalism" (Article 114), which was continued between the world wars in "Prague Functionalism" (Article 115), and through the work of R. Jakobson influenced European and American "Structuralism" (Article 116). The Baltic area gave rise, after World War II, to Hjelmslev's "Glossematics" (Article 117) and the "Moscow-Tartu School" (Article 118), whose questions and concepts were taken up and further developed by Greimas and his school in Paris (Article 119) and by Eco in Italy (Article 120). A critical stance to all these developments is taken by Goodman's semiotics of art (Article 121) and by

"Post-Structuralism" based on Derrida's grammatology (Article 122). Indicating future options of semiotics, these articles form the end of Volume 2 of the Handbook.

3.4. Part D: The relationship between semiotics, other interdisciplinary approaches, and the individual disciplines

Part D (Chapters XIII and XIV) in Volume 3 is intended to meet the demand, often made but as yet unrealized, for a systematic reconstruction of the sign-related university disciplines and interdisciplinary approaches on a semiotic basis. It is introduced by Article 123, "The Relationship between Individual Disciplines and Interdisciplinary Approaches", and covers in **Chapter XIII** the interrelation between "Semiotics and the Philosophy of Science" (Article 124), "Semiotics and Information Theory" (Article 125), "Semiotics and Systems Theory" including cybernetics (Article 126), "Semiotics and Synergetics" (Article 127), "Semiotics and the Theory of Developmental Processes" (Article 128), "Semiotics and Gestalt Theory" (Article 129), "Semiotics and Psychoanalysis" (Article 130), and "Semiotics and Hermeneutics" (Article 131).

Since each interdisciplinary direction of research is characterized by a multiplicity of teachings, sometimes incompatible with one another, each article must give a pluralistic account, showing that there are a number of alternatives possible in the specification of the relationship to semiotics. It is not so important, for example, whether the author considers hermeneutics a branch of semiotics or not, or whether he describes the two fields as complementary or overlapping; more important is the justification he or she gives for this by explaining the underlying conception of the purposes of hermeneutics and semiotics.

The authors of **Chapter XIV**, which deals with the individual disciplines, have less of a free hand. Through their position within the division of labor of the university, the individual disciplines mostly have relatively stable problem areas, subject matter and methods. Differences within a discipline are usually shown clearly by the terminology used. The introductory Article 132 shows how one is to proceed in the semiotic reconstruction of each individual discipline. It has to be demonstrated which parts of the **subject matter** of a discipline are sign processes, how these special types of sign processes can be de-

scribed in the framework of theoretical semiotics, and how the discipline's traditional terminology can be explicated, defined, complemented or partially replaced on that basis. Also the **methods** (among them text analysis in the humanities, field work in the social sciences, and measurement operations in the natural sciences) are to be examined with regard to the extent to which they are sign processes, and the methodology of the discipline in question has to be systematized and improved on this basis. A special case occurs when a discipline includes in its subject area living beings with whom the scientist must communicate as part of his job. This has important consequences in psychology, law, and medicine so that the professional-client communication plays a central role in the semiotic reconstruction of their methods. Not without reason the disciplines also differ greatly in the **modes of presentation** used for their results and in the ways of reasoning developed by their representatives. They, too, must be semiotically justified with reference to the purpose of each discipline, and modified if a justification proves impossible.

These goals require that all articles of Chapter XIV explicitly refer to the articles of Chapter I. The concepts, axioms, theorems, and principles of general semiotics introduced there are to be adopted in this section and used as a basis for a systematic presentation of the discipline in question as a branch of semiotics. Ideally, each article provides, after an informal introductory characterization of the discipline, a hierarchy of definitions and a set of axioms covering central parts of its subject area; it goes on to show by way of examples how selected branches of the discipline can be explicated on this basis. Then there is a discussion of the as yet unsolved problems, which leads to an assessment of the future measures necessary for a complete semiotic reconstruction of all reconstructable parts of the discipline.

All articles of Chapter XIV describe the "semiotic aspects" of an individual discipline, but their headings are differently formulated. Those disciplines that investigate semioses can be referred to with a compound term consisting of "semiotics" as one constituent and a name for the special type of semioses investigated as another: "Biosemiotics", "Neurosemiotics", "Medical Semiotics", "Psychosemiotics", and "Semiotics of Literature", "Semiotics of Music", "Semiotics of the Fine Arts" are cases in point. Such terms would,

however, be tautological if applied to disciplines which fall within the limits of theoretical semiotics, such as logic, and they would be contradictory if applied to disciplines which do not investigate semioses, such as physics; this is why the respective articles only have "Semiotic Aspects of …" in their heading.

3.5. Part E: Applied semiotics

Part E (Chapter XV, also in Volume 3) includes 18 articles on selected sign problems of industrial and post-industrial societies, which are only marginally treated in the context of the current university disciplines, if at all.

The most striking feature of contemporary industrial culture is doubtless the standard of its communication techniques. The influence they have on the world view of humans can be assessed if one imagines what communication was like before they were available. If someone were to learn of a remote event only through perception of the nonlinguistic reactions of the leader of his tribe, he would get a different idea of it than one who received a verbal description, a handwritten report, a printed communication, or a telephone message, or who had seen it simulated in cyberspace. Accordingly, the first article (159) of **Chapter XV** characterizes the changes that the development of communications technology has brought about in the attitude humans have towards nature and culture.

Ever since humans have existed on earth they have attempted to make predictions about the future on the basis of features of the present. This need manifests itself in a range of practices such as the oracle of Antiquity, the Chinese earthquake forecaster, Oriental palmistry, as well as European astrology, and American futurology. Article 160, "Divination and Futurology", gives a semiotic analysis of these practices.

Contemporary societies are characterized by their ways of classifying the activities of their members into duty versus leisure, their behavior into professional work versus hobby, and the time involved into work days versus holidays. The organization of work, the division of labor, the ways of communicating at the working place, and the procedures used for the reproduction of working skills and knowledge are central topics for a sign-based analysis of society. They are treated in Article 161, "Work".

The social problems created by the organization of work in industrial cultures are symbolically overcome in sports and games. This

is why inportance has steadily increased over the past hundred years. Article 162 examines them semiotically.

Sports often involve other animals, which brings into focus the task of communication between man and animals. Interspecific communication differs from intraspecific communication in many respects, one of them being the need to find shared perceptory channels and to abstract from the codes used in the intraspecific context. Article 163 treats the problems occurring in such situations.

Sports serve as physical education for adolescents and are used to preserve physical fitness in adults; corresponding means of maintaining the performance of the aging body are applied in geriatrics and studied in gerontology. Article 164 shows how the semiotic perspective can help to understand the ways in which a person's modes of perception, emotional capacity, and general codes are changed in the aging process. And it shows how semiotics can be of use in the development of measures against memory loss and in the construction of prostheses for overcoming other physical deficiencies.

Tourism is often also seen in the light of physical regeneration. It cannot be understood, however, without reference to the desire of experiencing the conditions of other cultures with one's own body. Seeing other ways of life and other people as representative of a particular country, city, or period is an iconic process of a special kind, which is analyzed in Article 165.

The world of business is also patterned in an increasingly subtle way by sign processes. Article 166 examines the kinds of signs used in product design, pricing strategies, market segmentation, sales talk, public relations and the cultivating of a corporate image.

An important area of business communication is advertising, which is increasingly influencing the other communication genres in industrial cultures. Advertising also provides good examples for the functioning of ideology in industrial cultures. It creates social reality by encoding it. Article 167 examines the history of the ideology concept, considers the techniques involved in the production of ideology, and discusses ways of unmasking them.

Writing is a particularly effective means of creating ideology. In industrial cultures it has acquired such a degree of prominence that even academic scholars for a long time staunchly neglected other forms of communication. This fact was criticized early by semi-

oticians, and thus the semiotics of nonverbal communcation, treated in Article 168, has been of great influence in psychology and ethology.

The semiotics of multi-media communication originated in a similar way and it is today continually taking on new tasks due to the rapid developments in electronic media. Article 169 discusses the challenge which multi-media communication poses to semiotics.

It has become almost impossible to imagine industrial cultures without pictograms. The number of official traffic signs alone has increased a hundredfold, from four to over four hundred, in twentieth-century Europe. Pictograms have become a favorite field of demonstration for the achievements of semiotic theories, as shown in Article 170.

Although industrialization rendered many traditional sign systems obsolete, it also created many new ones. Apart from graphical symbols and technical signs, one only has to think of acoustic signals: sirens, horns, the wailing of ambulances and police-cars, identification signals in radio, and the telephone code. The validity of such signs did not develop by way of convention, it was rather introduced by direct order or at least regulated by a standardizing public institution. Article 171 deals with this development.

The refinement of copying techniques and the parallel sensitizing for the original have created a further problem, which has long occupied aesthetics but has become a considerable economic factor today: imitations and forgery in arts and crafts. Article 172 analyzes the semiotic aspects of fakes.

Ciphers and secret codes have always had their place in the armory of diplomacy. Unimagined possibilities of making and breaking codes have risen from the use of computers, as is shown in Article 173.

Reformulating the content of a text in another code is a procedure necessary in all cultures. It is called "translation" and may be regarded as semiosis *par excellence*. The circumstances to be taken into account and the procedures used in translation between natural languages are the topic of Article 174.

Since the decline of Latin as the common European language, there have been many attempts to substitute an artificial language, conceived *a priori* as a notation of ideas or *a posteriori* as a simplified natural language. Article 175 deals with the function and structure of such universal languages and discusses the problems of their application.

With the introduction of the computer and the increase in the range of terrestrial transmitting and receiving stations, an age-old dream of mankind has come closer to realization: the establishment of contact with extraterrestrial beings, should they exist. As Article 176 details, the principles developed in the theory of universal languages find systematic application here.

With these articles on the present tasks of descriptive and applied semiotics, the Handbook completes the circle begun in the historical part with the description of medical semiotics and divination. Yet more special topics could have been picked out, but, unlike the others, this part of the Handbook is not meant to cover the whole problem area. Rather, it serves the purpose of displaying the variety of current fields of application and of demonstrating the capacity of modern semiotics to cope with them, so that the reader is stimulated to further development and creative application.

3.6. Part F: Working tools for semioticians

Apart from the systematics, history, and modes of application of semiotics, the Handbook offers practicing semioticians a series of concrete professional tools. The name and subject indexes allow the use of the book as an encyclopedia and as a dictionary. The German terms are listed alongside the English in the subject index, so that it can also serve as a bilingual glossary.

Anyone wishing for assisted access to semiotic societies and semiotic research and teaching institutions, or seeking to establish contact with other semioticians at summer universities or vacation courses, can make use of the review (Article 177) in **Chapter XVI** (appendix), which was contributed as a result of a worldwide survey undertaken by the International Association for Semiotic Studies.

The appendix also offers, in Article 178, a survey of other important semiotic reference sources: dictionaries, encyclopedias, and bibliographies as well as periodicals.

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2.   Syntactics

1.   Subdivisions of syntactics

Syntactics studies the conditions an entity must fulfil if it is to represent meaning for interpreters in semiosis (cf. Art.1). With re-spect to the traditional problem areas of semiotics, it is not always easy to decide whether they belong to the subject matter of syntactics or not (cf. Morris 1946: 219 f = 1971: 303). In many cases the answer will be different according to which conception of syntactics it is based on:

− syntactics$_1$ as the study of the formal aspects of signs (Morris 1929, 1937, and 1938: 13 ff = 1971: 27 ff),
− syntactics$_2$ as the study of the relations of signs to other signs (Morris 1937, and 1938: 7 ff = 1971: 23 ff), or
− syntactics$_3$ as the study of the way in which signs of various classes are combined to form complex signs (Morris 1938: 14 = 1971: 28 f and 1946: 354 f = 1971: 367).

The areas of research defined by the three characterizations overlap but are not identical. In what follows we will therefore use the term "syntactics" without a subscript only when we speak of syntactics proper, i. e., the science whose subject matter is the intersection of the subject matters of syntactics$_1$, syntactics$_2$, and syntactics$_3$.