Vocabulary of Semiotic Terms

This vocabulary comprises only those terms that were used in my works on semiotics. It aims to incorporate the terms within a single, complete framework that includes concise definitions of their main characteristics. The definitions of some terms have evolved over time, such that one can find diverse definitions of a single term in different works I have written. The entries presented here contain the latest definitions.

***Conventions:***

*Terms are arranged in alphabetical order.*

*Terms are highlighted in bold at the beginnings of their entries.*

*Alternative definitions of the same term are numbered within the entry.*

*Synonyms and elaborations of a term are placed in parentheses immediately following the highlighted term.*

*Terms that are defined elsewhere in the dictionary are underlined. Exceptions are the terms ‘sign’ and ‘sign-system’, which are repeated so frequently that it is awkward to italicize them every time they appear.*

**Abstractness of signs** – one of the leading characteristics of signs enabling them to decipher more and more significant traits of the denoted objects. Signs and sign-systems develop in the history of humanity along the parameter of their increasing abstractness. Such development evolves the parallel development of human intellectual resources – in each human being and in the humanity as a whole. Consequently, processing more abstract signs we constantly discover new and deeply concealed mechanisms of natural and social phenomena.

**Aggregate state** of a sign-system describes the strength of the “glue” that bonds the various signs in the system together. Bonds between signs may be very weak, as in a simple collection of signs of the same abstraction level (see degree of abstraction), in which the signs are not dependent on one another. Examples of sign-systems that have weak aggregate states are a “Who’s Who” list and a telephone directory; where any number of unrelated items can be placed. Intermediate aggregate states characterize more coherent systems, in which the members show a greater degree of interconnection and interdependence. I call these search-systems. For example, the Dewey decimal system for classifying publications is a search-system that has an intermediate aggregate state. The highest aggregate state is associated with the most coherent sign-systems, like languages, mathematics, and other formalized codes.

**Algorithm** (semiotic) – a method for manipulating signs of related referents by processing them according to the rules of the relevant sign-system. Usually, an algorithm deals with signs in one of the following ways: syntagmatically – arranging the signs in an order that meets the syntactical requirements of the system, or paradigmatically – changing the initial form and meaning of the signs. Each distinct group of signs in a system has its own algorithm; juxtaposition of all algorithms in a system comprises its topography. See also step in the algorithm.

**Allegory** – the symbolic content of a sign, as compared with its denotational content. For instance, in some manifestations a picture of scales designates “justice,” or “impartial judgment.” In these cases, the sign has an allegoric meaning – justice – as well as denotational content – the scales.

**Antonyms** – two or more signs that are opposite in their meaning. Antonyms are sometimes indicated by metalinguistic designations, such as opp., ant., or ↔.

Antonyms may consist of two contrasting signs, such as the words “difficult” and “easy,” or the mathematical signs ‘+’ and ‘–’. In some cases, a pair of expressions or gestures can also be antonyms. For example, a nod can mean, “you may enter the room,” whereas a shake of the head can be its antonym, meaning “you may not enter the room.” See also synonyms and homonyms.

**Audience** – all the interpreters of a sign. Signs are so important for humanity that their dissemination and uniform understanding become sometimes coercive and specially organized by society in the form of schools and other educational institutions (courses for potential motor drivers, for example). This type of audiences is called *captive audience.* There are, of course, *voluntary audiences.*

**Basic signs** (BS) – the main signs in a sign-system, that determine its type and the logic of its processing. Although a single sign-system frequently contains signs of varying deg­rees of abstraction, the basic signs of a sign-system must all have the same degree of abstraction. Thus, the traffic regulation system uses images, geometrical figures and words, but its basic signs are images. Hence, it is an iconic sign-system and the chief logic of its processing is transductive – each sign is dealt with separately in sequence. In notations, the basic sign is a grapheme, in mathematical codes, a symbol.

The introduction of the concept of *basic signs* enables us to build a hierarchy of the signs in a system, from those signs that are simpler than the basic signs of the system to those that are more complex. In languages, for example, words are the basic signs, but there are also simpler signs – morphemes, phonemes, etc. – that are below words in the hierarchy, and more complex signs – syntagms, sentences and paragraphs – that are above words. All of these signs are derivatives of words, though they themselves may be the basic signs of secondary linguistic systems. For instance, phonemes are the basic signs of phonetic transcriptions.

BS usually exist in combination with other types of signs. The resulting varieties may be of three types: a/ they may include only the nomenclature signs (thus the Periodic table of chemical elements includes only the symbols of all known elements); b/ include mostly merged signs, like physical charts in cartography and c/ conjoined nomenclature and merged signs, as in phonetic transcriptions.

**Betwixt and between signs** (b/b signs) – a category of signs whose quantum of abstraction is between variable signs and signs with denotational value. During sign transformations, variables are usually replaced by betwixt and between signs. Later, when the results of the transformations are applied to the concrete world, these signs are replaced by denotational signs. For example, formulas in physics initially include variables. Then betwixt and between signs replace variables, and later they are themselves replaced with signs that have specific practical implications. This three-stage transformation can be divided into two separate dual-stage transformations: transforming variables into betwixt and between signs and storing the results for future applications, or transforming betwixt and between signs into denotational signs that are applicable in life.

Betwixt and between signs may have another meaning, that of signs standing between the basic signs of the system. Then they are also called intermediate signs. Thus, minutes may serve as betwixt and between signs, if hours are accepted as basic signs for time designation. If days are fixed as basic signs for calendars, hours become their b/b signs in system paradigms.

**Branch semiotics –** the study and use of signs as part of the corpus of data collected within a specific scientific branch. In branch semiotics, the signs that are developed within a particular science are dealt with in accordance with the conceptual formulations and values of that science. In general semiotics, these same signs are handled differently, because they are analyzed within the context and conceptual framework of semiotics as separate branch of science.

**Chaotically created sign-systems** – sign-systems that come into existence spontaneously, without any predefined plan. People who work with and organize such systems constantly modify and restructure them in an effort to make them more systematic. To do this, they invent metalanguages for the systems. The metalanguages are used to create order within the sign-systems, a process that gradually reduces the entropy of the systems. This process is exemplified, for example, in natural languages, for which metalanguages (grammars and dictionaries) are continually being invented and employed.

**Closed sign-system** – a sign-system to which additional signs cannot be added.

There are two types of closed sign-systems:

1. Systems whose signs are arranged in a fixed order, like alphabets

2. Systems whose signs are not in any particular order, like a list of participants in a spor­ting event. A list of this sort has a finite number of members, but it may be rear­ranged in any way and for any of particular purpose. For example, it can be arranged by the days on which participants compete or by the sports in which they take part.

**Code** (semiotic code) can have any of the following meanings:

1. A textual code – a sign-system that can be used by other sign-systems, like a language, mathematics, or logical notation.

2. The highest type of sign-system in the semiotic hierarchy: mathematics or some other formalized code.

3. A collection of symbols. This meaning can be seen as borrowed from the original meaning of the term code, and is essentially non-technical in nature. An example of this usage can be found in the popular book, "The Da Vinci Code" by Dan Brown.

4. A secret, cryptographic system of signs whose purpose is to hide confidential information. This type of sign-system is unusual; most sign-systems are intended to be as clear and decipherable as possible.

**Code of unusual motivation** – a secret cryptographic code that is used to cipher confidential information (see also code, definition 4).

**Collection-system** (collection) – the type of sign-system that has the lowest aggregate state. A collection is an assemblage of signs that meet some particular criteria. All the signs in a collection have a similar degree of abstraction. In addition, a collection-system is always open-ended; signs can be added to the collection or removed from it as required. An example of a collection-system is an assemblage of all of the first names that are used in a particular community. After collections, the type of sign-system that has the next higher level of system coherence is the search-system.

**Composite construction of a semiotic field –** a type of construction in which the signs in a field are manipulated using a collection of semiotic algorithms that treat various groups of signs in the field separately, using distinct techniques. For example, a language has a composite construction because it handles different parts of speech differently, even though they belong to the same semiotic field (definition 1).

A semiotic field that has a composite construction is created by using a global syntactic configuration as a template for the sign-system and populating the sign-system with specific signs that meet the requirements of the template. The result is a single semiotic field (definition 2) that has defined rules and boundaries. For example, a written text is a sign-system that contains specific letters, words, sentences and paragraphs. The global syntactic configuration of the text defines how these elements can be placed in the text, how the boundaries between these elements must be inserted (empty spaces of various sizes between certain elements), and how the boundaries of the entire text must be identified (additional empty spaces).

**Compound sign** (compound) – a sign that is produced by combining two or more simple signs. Thus, O16 (oxygen isotope) is formed from two simple signs; similarly, a musical note with a dot near it (indicating that the sound should be prolonged) is a compound of two signs. In some cases a morphological addition is also inserted into the compound, as with a musical note followed by a dot and a crotchet or an arco. Compound signs should not be confused with semiotic syntagms – strings of signs that constitute meaningful pieces of text. See also, derivative sign.

Compounds tend to turn into idiomatic complexes. In this case, their parts are so closely linked that they become inseparable and are not even identified with their primary meanings. Examples of the latter are idioms in languages and formulas in algebra or physics. In this way they give birth to merged signs.

**Concept** – one of the forms of words, which not only denote something in the ontological or semiotic realities, but also mold discourse within a science or practical activity. Concepts accompany the formation of scientific language in every developed branch of science. They are defined differently from mere notions, by using more precise terminology and more rigorous logical procedures.

**Concurrent sign-systems** are multiple sign-systems that can use one another’s texts. By contrast, non-concurrent systems require a translator for understanding and further processing of borrowed texts. See also inertial frames of reference.

**Connotation** – an additional feature of a sign that is reflected primarily in its denotation. For example, smoke is the denotation of a sign that signifies a fire; the color of the smoke is a connotation of the smoke that may indicate the type of material that is burning in the fire. Similarly, the specific qualities of the smell of the smoke are connotations that may convey additional information to those who recognize them. Connotations are the simplest syntactic ties within a sign that is derived from ontology (as compared with a sign that rely more on the human mind).

**Conventionality in signs** – a reference to the fact that some signs are connected to their referents by convention rather than by a resemblance to concrete objects or situa­tions. That is, while some signs look like the objects or situations they denote, others, like symbolic gestures, or the sound of a gong used in theatrical productions to indicate that the show is about to start, are only connected with their referents by convention. The degree of conventionality varies from sign to sign, and many conventional signs are specific to particular cultures.

**Cursive forms of signs** – forms ofsigns that areused to make them simpler and quicker to reproduce. More often than not, the cursive form is less complicated than the formal image of a sign. In addition, it is usually linked in some way with other cursive signs. A cursive form may depend upon the intuition of the user (like a clock face without numbers) or may be systematically learned by users (like cursive letters in writing). It may even be used as a teaching aid (for example, contour maps in geography).

**Degree of abstraction** (quantum of abstraction):

1. *of signs* – the extent to which a sign is detached from its referent; the farther a sign is from its referent, the more abstract it is. Thus, natural signs, which are parts of the things they signify, are the least abstract signs. The degree of abstraction is greater in images, and increases further with words, graphemes and symbols (in this order). Special characteristics of signs and their systems are revealed by their degrees of abstraction.

2. *of sign-systems* – the extent to which a sign-system is abstract. This is a function both of the degree of abstraction of the signs that form the sign-system and of certain features of the system itself, like the logic of processing it.

**Delayed verification** – verification of sign-system manipulations that takes place after the process of manipulation is completed. The verification period may extend for days, months, or even years, especially when highly abstract systems are being treated. For example, delayed verification is a common feature in cosmological investigations or mathematical theories. Delayed verifi­ca­tion stands in contrast to step-by-step or immediate veri­­fi­cation of sign-system manipu­lations.

**Denotation** – that which is designated by a sign. For example, the denotation of a trail may be the prints of feet or paws. The additional characteristics of this sign are its connotations – whether the trail is fresh or old, was made by an adult or a child, etc. The denotation of a sign, combined with its connotational components and its syntactical ties, are the three components that compose every sign. However, the proportions of each of the three components vary from sign to sign (see denotational part of a sign).

**Denotational part of a sign –** Each sign consists of two main elements: *denotational* and *syntactic* (sometimes, *syntax* is replaced by *connotation* – see denotation). The *denotational* element designates something outside of the system – the sign’s referent; the syntactic element describes the sign’s established or potential bonds with other signs or with the global system configuration. Sign processing brings about changes in the denotational aspects of signs in accordance with their syntactic characteristics.

**Denotational sign** – see out-of-system sign.

**Derivative sign** (derivative) – a sign that is usually produced from one or more simple signs and some addition (affix, letters or diacritics). There are two types of derivatives: morphologic derivatives and compounds. Morpho­logic derivatives are built by adding a morphologic component to a simple sign: “chair” + “s” = “chairs” (see also, morphologic paradigm). Compounds are built by combining two simple signs: “chair” + “arm” = “armchair.” Compounds may also have morphologic components added to them: “many” + “fold” + “ed” = “manifolded.”

**Empty syntactic spots** (empty space):

1. Blank spaces that are left intentionally in a semiotic text in order to be filled by other signs of a lesser degree of abstraction. Examples include the empty squares in a cross­word puzzle that are to be filled by letters, and empty places on a clock face that will be filled by the appropriate figures. These empty spots have the highest level of abstraction, and provide the framework for the process of release from excessive abstrac­­tness in a semiotic text.

2. Blank spaces that are used to define the boundaries of signs or semiotic configurations; especially blank spaces that are left between the other signs of a written text, such as its words, sentences, or paragraphs.

**Entropy** – the degree of chaos and disorder in a system. Unlike ontological systems (biological, physical, etc.), sign-systems, which are created and improved by peo­ple, always gravitate towards reducing their levels of entropy.

**Formalized code** – see Mathematical sign-system.

**Form of a sign** – the exact appearance of a sign. A single sign may have many forms that resemble each other but have slight differences. For example, in a single writing system, the appearance of individual letters may vary, as they do in the various fonts that belong to the system of notation recognized by computers. Diverse forms of a single sign sometimes develop into significant sign variations. This occurs, for example, with capital letters, which can have qualities that are different from those of their lower-case forms.

**Formula** – in mathematics, a strictly formulated, inseparable semiotic paradigm for working with a group of related signs. In semiotic argot, formulas are called idiomatic complexes.

**Fragments** of semiotic fields, like squares in checkers or space made by crossing meridians and parallels in geographic charts. Fragments must fully fill in the whole semiotic field. Inside are situated all the signs which we want to show in the field. Note that different semiotic models of the same designated object may result in different fragmentation with different fragments not only in form, but in essence. For example, geographic charts and globes reflect the same object (planet Earth), but they present their fragments with great discrepancies. This brings about differences in signs they contain and their variations in form, like in the outline of continents and islands.

Fragments contain not only denotational signs, but also functional and syntactic ones (see also links and orientation signs).

**Functional sign** (systemic sign) – a sign that is used to process other signs, the latter of which denote things in ontological or semiotic reality. Two kinds of functional signs exist: syntactic signs and logical signs. See also systemic sign.

**General semiotics** – a branch of science that studies signs and their systems within its own conceptual framework. General semiotics stands in contrast to branch semiotics, which looks at each sign-system from the point of view of that branch of science, that makes direct use of it.

**Global syntactic configuration –** a general characterization of a particular semiotic field. For example, written texts, drawings, and traffic lights all have global syntactic configurations that are based on their syntactic designs. There are internationally accepted global syntactic configurations that give rise to different sign-systems – like the axis of coordinates that underlies circles, columns, and lines. There are also national (or sub-national) global syntactic configurations, like the rules for composing a written text in a specific language, or like a national alphabet.

The set of [longitude](http://en.wikipedia.org/wiki/Longitude)s and [latitude](http://en.wikipedia.org/wiki/Latitude)s used in cartography is another example of a global syntactic configuration. This configuration comprises many rectangular sections in which different denotational signs can be placed. Without a “chessboard” of this sort, we could not place geographic signs in their proper places so that they might accurately reflect their actual arrangement in reality. I call components like these rectangular sections syntactic fragments.

**Graphemes**: Any basic sign in a notation sign-system. The forms of graphemes are quite whimsical and arbitrary: dots and dashes in the Morse code alphabet, notes in music, flag signals, etc.

**Group of signs** (sign group) – a group of signs within a system that are processed according to similar rules. For example, ones, tens, hundreds, etc. are groups within the system of natural numbers; they belong to the same system and are represented by the same figures, but they are handled differently and should be learned separately. Similarly, the chemical elements presented in the periodic table are divided into groups, each of whose members are handled by means of different or similar rules and procedures. An assemblage of all of the groups in a system constitutes the topography of the semiotic field represented by the system. See also algorithm.

**Homonyms** (homonymous signs) – two or more signs that are similar in form, but different in meaning. Thus, a ‘>’ symbol may serve as a greater-than sign in a mathematical system, while it serves as a sign of direction in another system. Homonymous signs may also belong to a single system, like homonyms in a language.

**Iconic sign-system** – a sign-system that uses images as its basic signs. In the onto- and phylogenesis of human development, iconic sign-systems follow natural sign-sys­tems and are followed by languages. Most cultural phenomena, such as drawing and theatrical productions, belong to this kind of system.

**Idiomatic complex** (idiom) – the result and final stage of sign merging (see also merged signs). The intermediate stage, where we can distinguish the parts of the complex and sometimes transform them, is called a compound sign. Idioms are inseparable and unchangeable, and they are used as if they were a single simple sign. Examples of idioms are idiomatic linguistic expressions and mathematical formulas.

**Image** – the basic sign in iconic sign-systems. Images are isomorphic with their referents. This isomorphism may be expressed by a patent resemblance between the sign and its referent, or it may be a matter of *convention* (see conventionality in signs), as when people agree that the figure of a lion in a coat-of-arms means “strength” and “influence.”

**Immediate verification** (step-by-step verification) – verification of sign-system manipulations that takes place during the process of manipulation. Not all sign-systems are subject to immediate verification, but some systems with relatively low abstraction levels invite and even demand it. Thus, when painting a portrait or a landscape, artists often divert their eyes from the pictures they are painting in order to compare them with the objects they represent and thus verify their accuracy. In mathematics, by contrast, the process of manipulation is bound by the rules of transformation, and verification in terms of its consistency with the real world can be undertaken only after a final result has been achieved. See also, delayed verification.

**Inertial frames of reference** – concurrent sign-systems that are used for spatial relations and motion. In order for multiple sign-systems of this type to belong to the same *inertial group*, they must share the same orientation towards the objects they describe (Earth or other celestial bodies) and/or the same frame of reference (observation point). Each sign-system in the group may use different types of charts, as long as they share the same orientation and frame of reference.

*Non-inertial frames of reference* are non-concurrent sign-systems in the sense used above. They are also used for spatial relations and motion but have different points of observation and another orientation (for example that of skies and not of the Earth). A sign-system that is included in an inertial group is not compatible with any sign-system of non-inertial group. They have different syntactical configurations and sets of different signs.

**Intermediate signs** fill up semiotic intervals between the basic signs in a system. For example, if you choose hours as basic signs for defining time, minutes, seconds, etc., become intermediate signs. But if you choose the whole day as a basic sign, hours become intermediate signs. *Basic signs* and *intermediate signs* together compose mixed signs, like ordinary or decimal fractions. (Note that intermediate signs are not the same as betwixt and between signs.)

**Interpreter –** a person who understands something from ontological or semiotic reality as a sign, that is, as something that represents something more than itself. Humans consciously and actively grasp the nature of signs, and even of the absence of signs. By contrast, inanimate objects, plants, and animals can follow or make use of the established order of things around them, but they can only do so unconsciously, by instinct or reflex.

**Isotopic sign** – a sign that denotes one of a group of related referents. Thus, *O* denotes any type of oxygen, whereas *O16* and *O18* are isotopic signs, each of which denotes one of the oxygen isotopes. Sometimes, a general denomination is used to refer to all of the members of the group, while isotopic signs are assigned to each specific class of a referent. For example, the word “chair” means “chair in general,” even though such an ob­ject does not actually exist. In reality, there are only specific types of “chairs” – “garden chairs,” “stools,” “armchairs,” etc. – and these types of chairs are denoted by the isotopic signs within the group of chairs. A general denomination like “chair” is called a poly­se­mic sign.

**Language system** (language, linguistic sign-system) – a system based on words as its basic signs. Examples of language systems are natural and artificial languages, esoteric languages that communicate by means of whistling or drums, sign languages like those used by the deaf, and philosophic languages. Written languages that are composed of *nota­tion signs* (graphemes) belong to another type of sign-system, that of notations.

**Linear construction of a sign-system** – organization of the signs in a sign-system as a simple ordered list, one after the other. The alphabet, for example, is built linearly from the beginning to the end. By contrast, the periodic system of chemical elements is not linear; the signs in the system are divided into groups, represented by rows, and certain qualities are repeated in each row (see periodic construction of sign-systems). Similarly, in cosmology we do not use a linear system; rather, the system comprises celestial objects of various types, and each type of sign is handled using a different algorithm. In fact, the construction of the semiotic field of cosmology is neither linear nor periodic, but composite.

**Linear processing of sign-systems** – the process of converting a string of signs into a coherent and logically structured sequence, as in the synthesis of a text from an assemblage of phrases. Whereas thoughts may be formed synchronously, their sign reflection – their expression by means of speech, a mathematical equation, or the like – is always sequential and sometimes linear.

**Links (link-signs)** may be divided into two groups: a/ connecting other signs in one and the same system; b/ referring to signs from different texts or even sign-systems.

In the first case, they generally are used as dashes, equality marks or some other signs of the same meaning. It may be also an arrow for continuation of our activity or a punctuation mark showing that the narrative will go on.

The second kind of links show either the source of citation or separate explanation to the fact stated in the corpus. With the development of the communication via computers we diversified other kinds of links: footnotes, endnotes and also links leading us to other sources of knowledge relevant for our search.

**Logic of processing sign-systems** – the way reasoning people employ to make use of a sign-system. I have identified the following four types of logic that are used in the proces­sing of sign-systems. All four types are inherent to the process of using any type of sign­-system.

*Matching logic:* Identifying the correspondence between the real situation and the sign-system. For example, imagine you are driving in an unknown locality. To find your way, you make use of both road signs and your external surroundings. By matching the two, you derive the information you need to proceed towards your destination.

*Formal logic:* Applying the standard principles of reasoning. This type of logic is employed in all human actions, in both ontological and semiotic reality.

*Sign-system logic:* Applying the internal rules of the sign-system. For example, imagine that you are driving and you arrive at a traffic circle. To proceed into the circle safely, you need neither road signs nor formal logic; all you need is to know the traffic rule that gives the right of way to vehicles that are already in the circle.

*Application logic:* Interpreting unfamiliar signs. For example, imagine that you are driving along a familiar road and come upon an obstruction of some kind, such as a large pothole, with unfamiliar signs around it. To deal with this situation, you must quickly interpret the signs and apply them to the situation. Our explanations of the semiotic matters are always dependent on the audience we are addressing; that is why, these explanations make us follow also its *application logic.*

**Logical sign** – a functional sign that helps build a coherent, logical text. Examples of logical signs are the word pairs “if…then,” and “either…or” that may be used in natural languages or in computer programming where special symbols synonymous to them are in use.

**Main sign-system** – the primary sign-system in a grouping of all of the systems that serve a single purpose. For example, natural languages serve as the main means of communication among people; they are the main sign-systems among a variety of systems that help languages to carry out this task (grammars, dictionaries, phonetic transcriptions, and many other secondary sign-systems).

**Mathematical sign-system** (mathematics, formalized code) – a sign-system based on symbols as its basic signs. Symbols have the highest degree of abstraction among all signs, a feature that engenders distinctive characteristics in mathematical sign-systems. Rather than dealing with ontological phenomena directly, mathematical systems usually deal with mental mathematical interpretations of these phenomena. Two types of mathematical sign-systems exist:

1. *Mathematical sign-system including signs with fixed referents***,** like those used in physical or chemical formulas or in arithmetic with nominal numbers.

2. *Mathematical sign-system including variables*, like those used in algebra or in syllogisms, that use letters as variables. These are sign-systems of the highest degree of abstractness (much higher than systems whose signs have fixed referents). In these systems, syntactical components practically replacethe denotational parts of signs, so that the signs only retain syntactical elements.

**Meaning of signs** is what they denote in ontological or semiotic realities. The meanings of signs comprise not only the designations of their referents (denotations), but also their connotations and syntactical ties.

**Merging of signs** – the state of some compound signs reached when they become solid and inseparable unity (see also idiomatic complexes). First, isolated signs receive some diacritics or merge with another sign freely, then the use becomes habitual and gradually gets the status of a norm. In the long run mergers enter the stock of basic signs in a particular system. Compound words in languages (‘icebreaker’, ‘breakthrough’, et al.) or algebraic formulas are typical examples of merged signs.

**Metalanguage of a sign-system** is a set of rules for processing the signs included in the sign-system. A metalanguage also comprises the enumeration of all the signs in the system, their hierarchy, and their composite parts. The set of rules includes procedures for forming compounds and algorithms for processing them within the system framework.

**Mixed signs** are composed of basic signs and intermediate signs that belong to the same sign-system. Examples of mixed signs are mixed fractions (ordinary ratios or decimals), and musical notes with a sharp, a flat, or a natural symbol.

**Models** (semiotic models)of ontological or semiotic phenomena illustrate their primary characteristics and the connections between these characteristics. Examples are models of an atom, of the Solar system, and of a benzyl molecule. Note that semiotic models differ from material models, which attempt to accurately portray in miniature form how things like objects in ontology look. Semiotic models may be primary, giving only fragmental mental representation of the object or occurrence. Thus, the model of atom, proposed by Rutherford in 1911, was very sketchy and approximate, but it gave impulse for further investigations. They brought about more substantial models of atom construction, until we came to the agreed upon and final model (for the time being).

**Models of a sign** – The following three types of sign models exist:

1. A model of a sign as it interacts with its referent, on the one hand, and as it is presented in our minds (idea), on the other.

2. A model of a sign in a sign-system, presenting its interaction with the system in which it is included.

3. A model of a sign (and of its sign-system) as it is incorporated into the body of human know­ledge.

**Monosemic sign** – a sign that refers to a unique object or idea, like a proper noun in a language. *Monosemic signs* stand in contrast to polysemic signs.

**Morphologic paradigm** – a construct that comprises all the different morphologic forms of a single sign. In languages, morphologic paradigms are well-known. The words “table,” “a table,” “the table,” “tables,” and “table’s” constitute such a paradigm. The sign that gives rise to all the other forms (“table”) is called the basic sign. All the other forms are called derivatives. Morphologic paradigms can also be constructed for chemi­cal isotopes and many other types of signs.

**Morphologic level of syntax** defines all the basic signs of the system and endows them with their potential qualities for ties with other signs (see morphologic paradigm). It is the first level of the syntax in sign-systems, and is afterwards completed by syntagmatic, sentence and textual levels.

**Natural sign-system** – a sign-system that is built on natural signs. Orientation by the stars and diagnosis of illness by means of visible symptoms, are examples of natural sign-systems.

**Natural sign** – a sign that consists of a part of an observed phenomenon. The observer (interpreter) uses the part to reconstruct the whole. For example, smoke indicates the presence of a fire, and the polar star signals which direction is north. Natural signs tell us about things that we cannot fully perceive directly.

**Nomenclature** (nomenclature signs) – the simplest kind of signs denoting the very basic ontological elements in their semiotic interpretations. For colors these are the examples of the seven chief colors + that of the white. For music – seven notes in the octave. For chemistry – the nomenclature of all known elements, etc. They give birth to all the derivatives – compounds and merged signs. These latter are added to nomenclatures as basic signs of this or that semiotic system.

**Notation** – a sign-system that is built on graphemes as its basic signs. In many notations, the forms of the signs are chosen at random. The most common example of a notation sign-system is alphabetic writing, in which the letters are graphemes – arbitrary characters that represent the various sounds of the language. Other notations that are based on arbitrarily chosen graphemes are musical notations and cartographic signs.

**Notion:**

1. A construct in our minds that represents something from ontological or semiotic reality. Signs reflect things that usually exist in those realities, but they are always transfigured by our mental notions. By the way, this meaning is often presented by the word "idea".

2. A type of words that denote multiple things of a particular type. In this sense notions differ, on the one hand, from proper names, which only designate individual things, and, on the other hand, from concepts, which, although they are also used for designating classes of objects (like notions), but also organize scientific discourse in particular branches of knowledge or practical activities. So, concepts in this row are a special kind of notions.

**Ontological reality** – the external world as it exists around us. We can change ontological reality, but we do not bring it into being and cannot remake it completely to our liking. Ontological reality stands in contrast to semiotic reality, which is entirely a product of our conscious minds.

**Open sign-system** – a sign-system that is specially constructed to be open-ended and have the potential to incorporate as many new signs as necessary. Examples of open sign-systems are the string of natural numbers and a telephone directory. Open sign-systems stand in contrast to closed sign-systems.

**Operational sign-system** – a sign-system that relies moreon a concrete ontological situation than on our mental images of things. Examples can be found on product labels and on signs that help people orient themselves on roads, in shops, and in offices. Operational sign-systems are inseparable from their ontological surroundings, and it is these surroundings that determine their practical value and meaning. For this reason, they are not included in our sign classification.

**Orientation marks** show how to use a concrete sign-system. Thus, wind rose and the scale on maps are such kind of signs. Keys and time signatures on the musical line-up are other examples. Metalanguage inserted into the system is also a kind of OM (legend in charts or title block on the drawing).

**Out-of-system sign** (denotational sign) – a sign that denotes something outside of the sign-system. Out-of-system signs can be processed within the system using syntactic signs.

**Overlapping of sign-systems** in different types. Types of sign-systems usually developed consequentially in line with the increase of their abstraction. Still in the course of human civilization some more abstract schemes preceded the development of less abstract systems. Thus, Earth cartography with its characteristic kind of conventional *images* appeared earlier than navigational cartography with very simple *images* inside a prolonged picture. Still, this sort of systems also belongs to the cartographic group and finds itself in the fourth level of types diagram.

**Paradigm** – see semiotic paradigm.

**Particular semiotics –** see branch semiotics.

**Periodic construction of a sign-system** – organization of the signs in a sign-system by dividing them into groups that reflect periodic variations in the properties of their referents. Periodic construction emphasizes the way the referents of certain signs have similar properties, making it possible to select the semiotic paradigm that is appropriate for each particular periodic group of signs. The best known system of this kind is the periodic table of chemical elements that was developed by Mendeleev. Circular systems like on the clock faces or in calendars are additional examples of periodic constructions. It is worthwhile to note that there are also separate signs with some part in them periodically coming back, like repeating decimals in mathematics.

**Polysemic sign** – a sign that can refer to any of a variety of objects of the same kind (“chair” as representing any chair in the world) or to any number of subgroups of the same general category (“chair” as representing different kinds of chairs: “armchair,” “Chippendale,” “nursery chair,” etc.). The subgroups are termed isotopic signs with reference to their common general name. They themselves constitute *polysemic signs* with reference to the individual objects that belong to their groups. For example, “armchair” is a polysemic sign with reference to each specific armchair in the world, and an isotopic sign with reference to the polysemic sign “chair.” *Polysemic signs* stand in contrast to monosemic signs.

**Potential signs.** Signsare sometimes presented inside an indiscriminate whole – a geographic map, for example. They are found there in their potential state and have to be activated in order to serve as fully-fledged semiotic entities for practical use. The same refers to interfaces in computer programs. Users choose among many potential signs those which they employ in the current operation; other operations will need other potential signs to be singled out and processed.

**Primary semiotic models** are sketchy and approximate representations of the studied object. They often show only separate relations of the designated substance. These models tend to proliferate into more substantiated images which in the long run become accepted by scientific community. According to these we create material models of the investigated matters and their practical applications.

**Recharging of signs** – transplantation of signs from one position in a sign-system to another, usually more important position, the thing that leads to a greater weight of the sign in the system. For example, in arithmetic, placing the same figures into higher ranks in order to denote larger numbers is a way of recharging those figures. In some cases, as in the example above, recharged signs remain as they were, only with a different weight. In other cases, recharged signs are replaced by other signs. This is the case, for example, in chess, when a pawn that reaches the last row of the board is converted into a different piece. What is important in all these cases is that the sign acquires a new content and weight in the system; it is this process that is called recharging. Recharging rules must be defined in the metalanguage of the system before the process can take place.

**Redeployment of signs** has at least two variant meanings:

1. Replacing signs with synonymic signs of the same level of abstractness that are used in different ontological circumstances. Thus, when we measure things in our immediate surroundings, we may use the metric system based on meters (cm., mm., etc.). On the other hand, when we measure cosmic distances, we use parsecs, light years, or other units that are appropriate for such vast distances. Nautical units of distance are different from all of these units. But the idea of measuring distances and the application of units are common for all three cases. Only the units (signs) are different.

2. Copying a word or a component of a text in order to translate or explain it. Sometimes individual components of a compound that was created from a number of simple signs are marked in a text in order to indicate that they are explained elsewhere on the page. A copy of the marked component, such as an enlarged part of a picture or diagram, is then placed elsewhere on the page. This copy of the component is a redeployment of the original sign. Similarly, a text may include notes on particular words, such as translations of difficult words. When the original word is copied into the margin alongside its translation, the copied word is a redeployment of the original word in the text. Another example of the process is when a part of a picture or of a map is being zoomed; in this case the same sign appears, but in larger size.

**Referent** (signified) – that which is denoted by a semiotic sign.

**Register** – an alternative set of signs that can replace some or all of the standard signs in a particular system. Slang and argot are registers of natural languages. Musical arrangements of the same piece for different instruments are also registers; because they repeat the main traits of their prototypes, musical arrangements are registers rather than secondary sign-systems (see also variability of sign-systems).

**Release from excessive abstraction** – the process of converting abstract signs into their more tangible counterparts in order to make them useful for a practical application. This procedure occurs with all types of signs, but relatively abstract signs tend to use it more often and in more sophisticated variations than less abstract signs. In the most abstract sign-systems, it is an integral element of sign processing, and the process of *abstraction release* is incorporated into the defined procedures of their metalanguages. Thus, for example, these procedures are included in the standard rules of symbolic logic, and are included in the training of students of this field.

**Rigidity** – the degree of strictness and formality in the formulation of the meta-rules for processing a sign-system. In some systems, like mathematical codes, the rules are very formal and exact. In others, like painting, they are notably unstructured.

**Role of a sign** – a relative standing assigned by the rules of the system to each sign within the system. For example, every chess piece has an initial role in the game and its stature in various transgressions of the game (see also weight of a sign in the system).

**Search-system** – a type of sign-system that has an intermediate aggregate state. Search-systems are more consistent and internally coherent than collection-systems, but their signs have a weaker level of interdependence than those of languages and other highly abstract systems. Examples of search-systems are the Dewey decimal bibliographical classif­ication system and the Internet.

**Secondary sign-system** – a sign-system whose purpose is to help process a main sign-system. For example, languages act as main systems, while their grammars, dictionaries, and many other systems of various levels of abstraction, are secondary linguistic systems that help to explain languages and aid in their use.

**Semiosis** – see semiotic activity.

**Semiotic activity** (semiosis) – the creation and use of signs and sign-systems. Semiotic activity may be viewed from two points of view: that of the science of semiotics (see general semiotics), and that of the sciences that make use of its signs and sign-systems (see branch semiotics). In the first case, analysis of semiotic activity is imbued with notions that are specific to the field of semiotics. In the second case, the analysis is part and parcel of the science in which the semiotic activity occurred, and this science is the sole judge of the usefulness of the signs and sign-systems being analyzed.

**Semiotic code –** see code.

**Semiotic congruence** – the compatibility of one sign-system with another. Compatible sign-systems can easily be converged one into another; incompatible ones require translation. See also synonyms.

**Semiotic equalization** – one of the principal ways to transform signs in a system, this process entails equalizing the various synonymous forms of signs. In math, this process is made explicit with the sign of equality (=). In other systems, it is not explicit, but it nevertheless exists, and is expressed through explanations, comparisons, synonyms, etc.

**Semiotic field:**

1. The assemblage of all the signs for referents represented by them. This semiotic field defines the boundaries of the system’s domain.

2. The entire configuration of a particular semiotic text, including its signs, the syntax defining how these signs relate to one another, and the empty space that defines the boundaries of the text. See also text in semiotics.

**Semiotic model** – see models (semiotic)

**Semiotic paradigm** – a way of constructing semiotics as a kind of science, distinguishing it from other sciences. This is done to keep all semioticians within the same strain of semiotic procedures. It includes philosophic underpinnings of semiotic investigations, its own axiomatics, classification of its principal concepts (like signs, sign-systems, semiotic reality, basic signs and others), its specific terminology and all other parts of scientific paradigm.

**Semiotic projection:**

1. A semiotic model of a possible implementation of an elaborate scientific theory. For example, in 1874, Ernst Hekkel built his *Tree of Human Evolution*, in which he drew all the hypothetical junctions of human development, from the amoeba up, in accordance with Darwin’s theory of evolution. This was a semiotic projection.

2. A device for translating ontological phenomena into the realm of semiotics and vice versa. This type of semiotic projection is similar to the type described in definition 1, but the level of detail is more rigidly defined. For example, in order to create technical drawings, we use axonometric projections that help us represent the parameters of the object that is being designed.

**Semiotic reality** – that which is embodied in signs and sign-systems. It is semiotic reality that is studied by every science that makes use of signs, and it is semiotic reality that is summarized in semiotics by means of its conceptual framework. Semiotic reality is as real as ontological reality; it differs from the latter only in that it was created through the conscious efforts of humans, whereas ontological reality was given to us ready-made.

**Semiotics** – a science of signs, sign-systems, and semiotic reality. In my view, semiotics ought to confine itself to the study of the scientific output of other sciences and other human activities, when this output consists of signs and/or sign-systems. The science of general semiotics should give new and additional consideration to this output by analyzing it within its own conceptual framework.

In my view, modern semiotics must be divided into four branches diversified according to their particular conceptual basis:

a/ the usual kind of semiotics based on signs and their systems conjured and advanced by humans;

b/ semiotics of plants and animals responding to signs by instinct or with primitive retorts of the ‘stimuli ↔ reaction’ type;

 c/ semiotics of signs implanted into machines or mechanisms by humans;

d/ semiotics of social character in different occurrences where signs not only ‘denote’, but rather symbolize some ideological value (in politics, religion, and other socially imbibed activities).

**Sentence level of syntax** superimposes the morphologic and syntagmatic levels and precedes the textual one. It procures rules for collecting all the syntagmas into a single sentence of a special type. In languages these may be declarative sentences, questions and exclamations (and other classes of them); in chemistry – various types of complete reaction notations; in algebra – cohesive equations, etc.

**Sign** – anything, that performs all or some of the following functions:

1. Stands for something else (its referent).

2. Characterizes its referent in some way.

3. Represents its referent in semiotic transformations.

What a sign represents is called its *referent* or *signified*. On this level signs strive, but can reflect their referents only as complete as possible. The task of doing it 100% is impossible, since both the object and the modes of reference are constantly alternating. Thus, the representation of the same object is endless while the object exists, each attempt enlisting the same or other signs.

Even the absence of a sign may be a sign, as when the absence of a plant in the window is used to mean “danger for potential visitors.”

A sign may be any object or property of the signified, as long as it is arranged in advance that it will be used as a sign for an observer (interpreter).

Signs more often than not are gathered in sign-systems, where their properties are fully flourished.

**Sign-bearer** – a physical or physiological device for the realization of a sign. Thus, a traffic-light box is a physical sign-bearer for the lights that are the signs of the system. The concept has two levels of meaning, narrow and broad. For example, notes in print (a book or a page) for a musical piece are sign-bearers in the narrow sense, while our voices or musical instruments are sign-bearers in the broad sense.

**Sign-system** – a set of signs that is built on a particular foundation. Its purpose is to enable people to process the signs instead of their referents. The processing of signs in a sign-system occurs according to the rules of the system’s metalanguage.

Sign-systems may be classified in a variety of ways. For example:

1. One of the most fundamental types of classification is based on the degree of abstraction of the basic signs in the sign-system. This type of classification is particularly interesting, because it represents both the structures of sign-systems and their historical development in onto- and phylogenesis. The following types of sign-systems are identifiable in a classifica­tion based on degree of abstraction. In human development, each type of sign-system in the list came into existence after the previous type, each new stage subsuming the previous one and also developing it further (see also overlapping of sign-systems):

* 1. Natural sign-systems
	2. Iconic sign-systems
	3. Language systems
	4. Notations
	5. Mathematical sign-systems (formalized codes)

Note: This last category is divided into two groups, *formalized systems whose signs have fixed meanings* and *formalized systems with variables* (as in symbolic logic or algebra).

2. Sign systems may also be classified by their modes of construction:

1. Linear construction – sign-systems that are built consecutively
2. Periodic construction – sign-systems that are divided into classes (groups) that are repeated periodically
3. Composite construction – sign-systems that include various groups whose algorithms of processing may be quite disparate

3. Sign-systems may be classified based on whether they are open or closed.

4. Sign-systems may be classified based on whether they were planned in advance or came into existence chaotically (see chaotically created sign-systems).

5. Sign-systems may be classified based on whether they serve as languages for constructing other systems (like linguistic or mathematical sign-systems; see textual code) or whether they are applicable only in a specific situation.

**Signification** (semiosis) – a semiotic process which results in the creation of signs and their systems. This process requires that there be a signified, a sign, and an interpreter of the sign (a human being) who is conscious of the fact that a particular sign represents something in ontological or semiotic reality.

**Signified** (referent) – that which is denoted by a sign.

**Social appraisal of signs and sign-systems** defines the boundaries of their distribution in human knowledge. It can also completely change the meaning of the whole sign-system. For example, postage stamps, which are usually issued to indicate that a required postal fee has been paid, can be turned into objects for inclusion in collections (philately). In this case, the role and weight of each member in the collection will be quite different from its role and weight in the original postal system.

**Step in the semiotic algorithm** defines consecutive actions with signs in their different applications. Important are not only the definite sequence of signs, but also gaps between the steps – they may vary in duration and also be interrupted by some instructions from out of the system. The Morse alphabet consists of dots and dashes; and gaps between them may by their duration show whether they break letters, words or paragraphs. Besides, while learning algorithms you may be instructed how to go on applying them in practice.

**Strategy of using signs and sign-systems** refers to the methods that developers of sign-systems employ to process signs. Strategies may change as new kinds of signs and sign-systems are developed. The more sophisticated signs and systems are, the more complex the strategy of processing them is, and the more time it takes to prepare people for dealing with them. Furthermore, the transition from a less sophisticated type of system to a more complex one can bring about a revolution in our way of thinking. This has been the case, for example, as the use of computers has spread and become very common in our times. See also algorithms, logic of processing sign-systems.

**Symbol**:

1. A basic sign in mathematical systems. There are two types of such symbols:

1. Symbols that have fixed connections to their referents. For example, *F* usually means “force” in physics, and “function” in mathematics.
2. Symbols with absolutely arbitrary connections to their referents, like algebraic and logical variables. These symbols can accept any referent of a type that is suitable for the sign and the system.

2. A trait of a sign that endows it with an allegoric force, usually of cultural or religious origin. In Christian tradition, the image of a cross, derived from the cross on which Christ was crucified, has acquired this type of symbolic power. This trait is encompassed in many signs, such as the crucifix and gestures that represent the crucifix. I call it the *ideological content* of a sign. Signs endowed by ideological content constitute a special group in the framework of semiotics, and must be investigated differently from signs of usual (de-ideological) format. This class has its specific properties and laws of use.

**Synonyms** – signs or expressions that have different forms (see form of a sign) but the same meaning. Synonyms exemplify semiotic congruence; they can be used to group signs that signify related referents and for transformations of relative signs within a system. Thus, most mathematical transformations are made by replacing the original expressions with synonyms. See also antonyms and homonyms.

**Syntactic components of a sign** – Each sign includes its possible or overtly expressed syntactic ties. For example, the syntactic components of a noun are all of its morphological variations. The syntactic components of a musical note are the different forms it takes in various notations. As signs become more abstract, their syntactic components take on a greater role. In the most abstract signs, they completely supplant the denotational part of the sign. This is true, for example, of algebraic notations.

**Syntactic constructions –** rules that define how all the signs in semiotic texts should be arranged. Syntactic constructions are divided into two categories: those related to arranging signs in extended strings, and those responsible for the configuration of a complete semiotic field (definition 2).

**Syntactic elements in denotational signs** – tokens that are placed within denotational signs even though they are not part of the denotation itself, because they indicate the syntactic category to which the sign belongs. For example, the markings on a clock face are arranged in a way that allows us to simultaneously derive hours, minutes, and seconds. To this end, each fifth mark on the face is drawn longer than the rest. Like the other marks, this mark functions as an indicator of minutes for the minute hand, but, at the same time, it also functions as an indicator of hours for the hour hand. Of the sixty marks around the face of the clock, twelve are elongated in this way. The length of the mark is, in this case, a syntactic element within the denotational sign of the mark. Because of this syntactic element, we only need one set of markings on a clock face; without it, we might require three different circles on a single clock face to indicate hours, minutes, and seconds.

**Syntactic sign** – a type of functional sign that is used to bind denotational signs together in order to produce syntagmas and, ultimately, complete texts. In combination with logical signs, syntactic signs define the order in which the denotational signs should be interpreted and provide keys for understanding the significance of their morphologic forms (see morphologic paradigms). Also orientation marks and syntactic links belong to this category. For example, a comma is a syntactic sign that completes a thought but at the same time indicates that it is not entirely finished and will be continued. A period, by contrast, is a syntactic sign that winds a thought up as a complete unit.

**Syntactic ties** of a sign are components of the sign that define its actual or potential relations with other signs or with the global system configuration. Syntactic ties vary from sign to sign. The simplest signs may consist exclusively of their designation and have no syntactic ties at all. For example, the Polar star in the sky is composed only of its denotation, which is “the direction that is north.” However, the scheme of this sign usually also includes Ursa Major. This addition is a *syntactic tie*, which helps us find the Polar star. At the other end of the sign-continuum, signs that are composed exclusively of syntactical forms (“boxes”) can be found. For example, the fullerenes that were recently discovered in chemistry are composed of pure syntactic ties. They can be filled with any chemical elements that are appropriate for a particular construction. Algebraic and logical variables are also examples of signs that are composed exclusively of syntactical forms.

**Syntagm** – the shortest meaningful fragment of a semiotic text. Syntagms can take different forms, depending on the type of text. They can be linear in writing or in chemical equations, part of a figure in a drawing, etc. Syntagms allow us to approximately predict the final result of a transformation we are aiming at and judge whether ongoing systemic operations are correct at that point.

**Syntagmatic level of syntax** regulates the collection of basic and syntactic signs into syntagmas (the smallest nuclei of the text with extra-systemic meaning). Syntagmas show through their tiny corpuscles, if we move about in the correct direction of sign manipulation or not. Then we gather syntagmas in complete sentences and texts.

**Syntax in sign-systems** – methods used to join denotational signs together into dimensional sequences, either by means of special syntactic signs or by implementing underlying syntactic constructions that specify how each sign should be placed into the field.

**Systemic sign** (functional sign) – a sign that signifies order within semiotic reality; that is, a sign that is used to process other signs. Systemic signs are also called functional signs; they can be either syntactic or logical. Signs that are not of systemic denotation are called “signs of out-of-system denotation,” “out-of-system signs,” or “denotational signs.”

**Systemzwang** – the tendency of a sign-system to unification. Systemzwang is a characteristic of systems that causes the accepted system patterns to be imposed on every innovation. The more planned and orderly the system is, the stronger its systemzwang.

**Term** has different meanings in various sign-systems, for example, in logic or in mathematics. In linguistics it means a special category of words, characteristic for a particular science or practical activity. In each of such activities terms are usually collected in *terminological dictionaries* or *lexicons.* Some terms enter both its scientific domain and general dictionaries of the same natural language. Thus, such widely used words like ‘hammer’, ‘pliers’ and ‘saw’ belong both to the lexicon of carpenters and to general English dictionaries.

**Text in semiotics** is a meaningful excerpt from a string of signs belonging to the same system. The excerpt must be complete both in substance and in form. Usually, a text in semiotics is a linguistic text, but it may be of a different nature – pictorial, mathematical, musical, etc. Any sign-system can produce texts.

**Textual code** – A type of sign-system that can be used by the sign-systems of many other scientific and practical fields. Examples of this type of sign-system are languages, mathematics, and logical notations. Textual codes stand in contrast to highly specialized sign-systems that can only be used for one type of application (see also operational sign-systems).

**Textual level of syntax** in sign-systems finalizes the construction of texts with the help of different signs. It accomplishes the work of all the previous syntax (morphologic, syntagmatic and sentence levels) with its own armory of rules. After gaining it, we finish up our venture both in content and form of the begot text.

**Topography of a semiotic field** – A semiotic field can be divided into a number of semiotic groups, each of which is handled using a distinct algorithm of rules. The collection of all of the algorithms that apply to all of the groups in a semiotic field are its *topography*. For example, algebra is a semiotic field that includes, among many other groups, second and third degree equations. The rules for working with each of these groups of equations were discovered and formulated by different mathematicians at different times. In addition, students of algebra study these rules separately. Nevertheless, these rules have a lot of common features and are all included in the field of algebra. Together they form its topography.

**Translation from one sign-system into another** – the process of converting the signs of one sign-system into a form that is usable in another, non-concurrent sign-system. The translation process is carried out by a translator – either a human or a machine.

**Type of sign-system** – a group of sign-systems that includes all those systems whose basic signs have the same degree of abstraction. I identify five types of sign-systems:

1. Natural sign-systems

2. Iconic sign-systems

3. Language systems

4. Notations

5. Mathematical sign-systems (formalized sign-systems)

The last type has two variations:

1. Mathematical sign-systems whose signs have fixed referents

2. Mathematical sign-systems with variable signs.

(See also sign-system)

**Variability of sign-systems** – the capacity of sign-systems to accept different forms for encoding the same phenomenon. Two types of variability exist:

1. Variability in which signs of different degrees of abstractness are acceptable. One example is counting, in which one can count by enumerating real objects, images, words, etc.

2. Variability in which alternative signs with the same degrees of abstractness are acceptable. Musical arrangements for various instruments and for voice performance are an example of this type of variability. Likewise, different systems of colors that are all based on the same seven components of the spectrum, such as those used for color TV, photography, or color printing present this kind of variability. In this latter case, the variability is expressed as a number of alternative sign-system registers.

**Variable signs** (variables) – signs that represent other, unknown signs, and are replaced by these other signs during sign transformations. Thus, *variables* in algebra are replaced by betwixt & between signs (which, in practical applications, take the form of denotational signs). Variables have very high degrees of abstraction, second only to empty syntactic spots.

**Visuality in signs** – the tendency in signs to comply with the picture which we come across in real life. We call it ‘to see and then to understand and behave accordingly’. At first, this principle is easily upheld (in natural and iconic systems), but soon signs become more conventional and unlike the images of what they reflect. Still sign-systems tend to ensure affinity between signs and the referents they embody in their external and/or internal essence. Then our mind accepts sign resolutions, even if they do not resemble the things of nature externally. One of such means is an empirical test of signs revelations. If in signs occurs a possibility of comeback to the external semblance, people readily catch up the chance – thus, pictures of the surrounding territory in distant photos from the sputniks quickly ousted the use of many charts with their conventionalities from our orientation habits.

**Weight of a sign** – the ways in which a particular sign affects the entire system and is conversely effected by it. Weight depends on many factors, the most significant of which are the syntactic constructions that define the current position of the sign, and the primary role of the sign in the sign-system. The same sign may have different weights, depending on its current position in the system. For example, in a number, the figure “2” may appear in various positions: a “2” in the ten’s position of a number has a different weight from a “2” in the one’s position.

 **Word** – the basic sign in any language system. A word can denote something in reality or something that has a functional role within the sign-system itself. Words are primarily conventional signs (see conventionality in signs).