INTENSION AND EXTENSION OF A TERM

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The term is defined as a linguistic sign which represents a designate, denoting together a concept and referring to a reference object. In the content part of this sign, the onomasiological basis and onomasiological mark are delimited. The designate as an element of idea, in which extension corresponds with the onomasiological basis of the content and intension corresponds with the onomasiological mark of the content, corresponds with the content as a linguistic element. These relations can be expressed in a bracket notation: [(content – form) – designate] → concept, object.

About ten years ago, the prominent representative of the Viennese school of terminology, H. Felber (1984) alerted that three significantly different approaches emerge during the exploration of the theoretical issues of terminology: factual, philosophical, and linguistic. In the factual principle, attention is focused on the relation between the term and the named object, in the philosophical approach the greatest attention is paid to the issue of the concept and the relation between the name and the concept, and the linguistic approach concentrates mainly on the relation between the naming and the named objects (Horecký 1987).

The starting point in linguistic investigation is the word or group of words and its function in the terminology of a field. The theory of terminology was significantly advanced by the researchers from the Prague school of functional linguistics. The concept of functional styles (however, not styles but languages or sublanguages were involved) opened up a wide range for the assessment of the word stock of the language of special purpose. The functioning of the words in the text was examined from the very beginning, words of the language of special purpose were differentiated from the other ones, but they were always studied as a whole. The study by J. Filipec (1994) is a classical example of the description of the word-stock of the language of special purpose. In specialized texts he distinguishes terms – words used in one sublanguage, typical of the particular field (e.g. mining, textile, logical), words used in more sublanguages (which as terms occur in several fields, e.g. in civil engineering, theatre, geology, sport, anatomy, mining), words used in a theo-

retical part (occurring in several fields, e.g. vector, set, equivalent) and terminologized words (which occur as non-technical words and in languages of special purpose, e.g. in anatomy, zoology, botany). Particularly in the second group the point of view – lexicological understanding of the term – is more than distinct. This is evident in the statement that the term is an unambiguous lexeme used in one sublanguage with specific concept-system relations (ibid., p. 39). The understanding of the term is then narrowed inadmissibly since the cited words used in more sublanguages also function equally well as terms.

R. Kocourek's (1965) understanding is very close to the mentioned approach; he specifies the term as a defined word. Of course, here the relation to the concept already emerges because we usually define a concept, not a word. R. Kocourek describes the history of this understanding in detail. For instance, L. Kopeckij distinguished between the automated word and the automated group of words. The term is here the word with a fixed and unambiguous meaning in the language of special purpose, the automated word is in its function similar to the term but exists with a different meaning or even in other functional languages, the automated group of words consists of several words but creates a semantic unity. It is a pity that L. Kopeckij did not attach more attention to the analysis of the automated groups which consist of both the terms and the automated words.

A. Jedlička (1948) uses L. Kopeckij's classification but he denotes the elements of all three groups as terms. His definition of a term is generally known: a term is a lexico-semantic unit of a specialized function of the standard language which has a precise meaning given in the specialized field by definition, convention or codification.

We see that also here the starting point is language or, in a narrower sense, standard language. The lexico-semantic unit is a complex naming of a group of words; however, respect for the definition or convention is characteristic. The concept of the codification is probably not substantial here.

J. Horecký alerted to the too one-sided accentuation of the linguistic background as early as 1956, when, in agreement with A. N. Terpigorev underlined the factual and/or conceptual viewpoint (of course, still without a special regard for the theory of concept) and defined the term as the naming of the concept. R. Kocourek (1965) also alerted to this difference and he also recorded a kind of swinging. While in *Základy slovenskej terminológie* (Basic Principles of Slovak terminology, 1956), J. Horecký confines himself to the system of the concepts in science or production, in *Zásady koordinácie* (Principles of Coordination, 1964), he concentrates only on scientific discipline and the concept is assumed to be expressed by definition. It seems that nomenclature is thus eliminated from a set of terminology, e.g. anatomical, botanical, zoological nomenclature, but also the nomenclature of products.

The need of defining the concept appears clearly in R. Kocourek's statement that the term is a defined word or a group of words (*souslovi*). It should be noted

that the need to define involves here significative meaning, i.e. the relation between the concept and the term assigned to it. In other words: the significative meaning of the term is given by an explicit definition in which the term is definiendum, the concept is definiens. It is not quite clear however what is significative meaning.

The issues of the concept and its place in defining the term were studied mainly by the representatives of the Viennese group. They understood concept in the Aristotelian way as a generalization or as abstracted entities. Contemplations on the relations among concepts are here important: traditionally logical and ontological relationships are distinguished: logical relationships include those of similarity, superiority/inferiority, overlapping and intersection, the ontological include relationships of contiguity and the relation between the whole and the part. In namings, the first relationships are used for metaphoric naming and the second relationships in metonymical or synecdochical namings.

By and large, contemplations of this kind vary within the logical type of concept: concept is understood as abstracted entity in contrast to the Platonic understanding of concept as extrasensorial entity, which, as a closed construction of thought has an identifying function also as a sense of expression. The sense of expression has its place in Felber's construction in which a sign concept is located between the expression (word, group of words, in principle sign) and the concept.

An analogous element in the construction of a term is also postulated by J. Horecký (1987), tying up on A.A. Ufimtseva who builds on the assumption of the two semantic triangles, denotation and semantic. J. Horecký uses the symbol of triangle Δ for this element in onomasiological chain and forms a transition between the linguistic sign (O – $\square$) and the concept. It will be more suitable to return to the concept of designate and denote it as D (and also F – form instead of the symbol $\square$).

It should be emphasized that J. Horecký understands concept (together with S. Watanabe) as a set of logical predicates and thus he also inclines to the explorers who perceive the concept as a mental entity, which has not only an identifying function but it also enables us to categorize, recognize things, evaluate new things, generalize the explanations of things (V. Černík 1995). According to this understanding the concept represents the knowledge of objects, represented by the possibility to respond, predicate substantial signs of the knowing object.
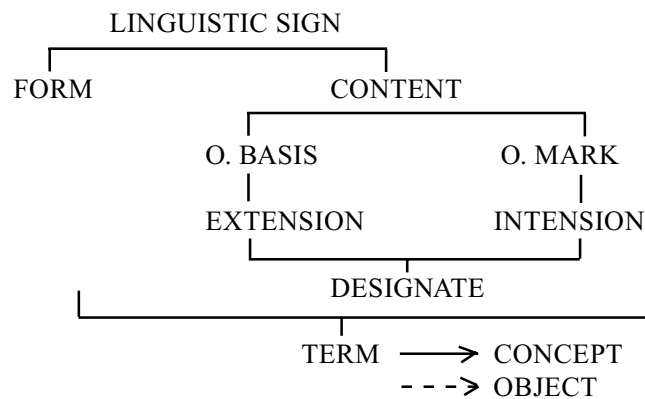
According to J. Horecký, such typical properties of the concept are concentrated in a designate, which serves as a support for the selection of properties, predicates in constructing the meaning component of the naming (for O).

These relations are illustrated comprehensively by an onomasiological chain Δ – O – $\square$ – P – J (Horecký 1974). On the basis of the drafted presuppositions and using the knowledge on the intension and extension of the concept (Runggaldier 1990) they can be interpreted as follows.

The elements $\square$ and O or F and O, i.e. the form and content create a linguistic sign. Its semiotic character is implemented so that it stands for the designate D (de-

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noted earlier Δ). The content of this sign (the denoted) is a set of semantic markers, one of which represents the onomasiological basis, the others create onomasiological mark (in terms of the onomasiological theory of M. Dokulil, 1962). The onomatologic structure, i.e. particular organization of morphemes (J. Horecký 1987), is the form of this sign. The division of the content into the onomasiological basis and the onomasiological mark is parallel to the division of the designate into extension and intension: extension corresponds to the onomasiological basis and intension is expressed by onomasiological mark. These two components create the structure of the designate. A linguistic sign together with a designate represent a term. Thanks to its structure, this formation can successfully fulfil two functions: denote the given concept and at the same time, refer to the given (reference) object.

Schematically:

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                    LINGUISTIC SIGN
              ┌─────────────────────┐
     FORM                       CONTENT
                          ┌─────────────────┐
             O. BASIS                  O. MARK
                │                         │
             EXTENSION                INTENSION
                └───────────┬────────────┘
                        DESIGNATE
         ┌──────────────────────────────────┐
                   TERM  ──────→  CONCEPT
                         - - -→  OBJECT
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In a bracket notation $[(F - O) - D] \rightarrow C.O$

This leads to the following definition: The term is a linguistic sign, which represents a designate, denoting together a concept, and referring to a reference object.

Such a definition naturally brings some consequences for the understanding of the term and its properties in practice.

In some cases, when extension does not concern one object, but sets of objects, it should be defined which objects belong to the set. For instance, a rule can be formulated that the extension of the term phoneme covers all sounds which are able to distinguish the meaning of the word in a particular language and have distinctive validity. Another rule, which, however, also intervenes in intension, is that the morpheme as onomasiological basis creates terms for units which are applied on the so-called -*emic* (langue) level. And then also terms for concepts which have the most general, main function (e.g. styleme, phraseme).

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In natural sciences, a rule can be formulated in a similar way that the names of minerals are formed by suffix – *ite*, i.e. all natural sorts of minerals, even the minerals obtained through synthesis, belong to the extension of the terms ending in -*ite*. Similarly, the names of chemical elements are formed by the morpheme -*ium* and the names of inflammatory diseases are formed by the morpheme -*itis*.

The examples show that in term formation, convention is applied to a certain extent and thus the demand of A. Jedlička that a term is a word delimited by either convention or definition is to some degree justified. It should be added, however, that the "right" to apply convention is usually acquired by particular scientific institutions, e.g. IUPAC for chemistry.

Convention is however applied not only in the extension component of terms but also in the intension one, namely in the selection of onomasiological marks or motivating constituents. There is for example a very significant convention that in the name of minerals, the geographical name of the region, in which the particular mineral was described for the first time or in which its occurrence is typical, is a motivating constituent. For instance, *bauxite* according to the town Bau, *kimberlite* according to the town Kimberley. The proper name of a person is often a motivating constituent in the names of chemical elements: *fermium, einsteinium, curium, mendelevium*. Convention is necessary here because, according to the overwhelming majority of theories, proper names do not have their own intension or their own reason for denotation (reference) to a particular person.

The same is also valid about the motivating value of numbers or numerals which are often used in the nomenclature of chemical compounds (Heger 1995). For example, in the names of acyclic hydrocarbons from 5 and higher: *pentane, ikosane* (20), *henikosane* (21), *hectane* (100), *dotriaconta hectane* (132). A similar system is applied in the names of chemical elements with atomic number above 104 (Zikmund 1995): *unundium* (112). A new name of the type of computer is motivated by a Greek numeral *penta* – five and the morpheme -*ium*. Greek letters in the role of numerals have a similar function: α-radiation, β-rays (Horecký 1981).

From the understanding of the concept as a set of data or knowledge of an object follows the possibility of changing the term as well as the possibility of the existence of several terms for the same object. In principle, the term does not react too quickly and not always react to changes in a set of predicates but one can find the change or adaptation to a set of predicates, their reflection in a designate. For instance the term *weight* was changed to the term *mass* as a result of findings that this value is not expressed by weighing i.e. by determining the relationship between the force acting on the body in the gravitational field of the Earth by acceleration of gravity g, which is actually gravity G, the unit of which is N (newton) or kp (kilopond). For the measure of gravitational inertia and gravitational properties of the object the term *mass* is introduced with a measure in kg.

Another consequence is the possibility of the existence of several terms motivated by a different sense. G. Frege's evening star and morning star for the planet

Venus can serve as a classical example. Denotation of these "variants" as synonyms is not appropriate because synonymity is a phenomenon and concept in the region of the primarily lexical meaning. Heteronyme or heteronymia seems to be more suitable.

The existence of trivial or special names in chemical nomenclature can also be included among classical examples of heteronymia. It does not concern only heteronymia of the type of (common) *salt – sodium chloride*, *formic acid – formyl*, *acetic acid*, *ethanic acid*, *tetradodecanic acid – myristic acid*.

A new form of heteronyme is often given by a different, new point of view. For example in inorganic nomenclature trivial names (*ozone, water, phosgene, ammonia*), traditional, semitrivial or semisystemic (*hydrogen cyanide HCN*, *hydrazine N2HN*) and systemic (*sodium chloride NaCl*) are distinguished. In the nomenclature of drugs for example chemical, generic, protected (ketazone) and international unprotected names are distinguished.

The motivated names *glycide, saccharide, carbohydrate* have a different starting point (there are also equivalent names in the national language, like *uhľohydrát* and *uhľovodan*). In Slovak names, "translated" equivalents are rejected because of the system point of view and return to international forms is recommended. Instead of *kysličník* and *sírnik*, the form *oxid* and *sulfid* are recommended (referring to the fact that there is no *uhličník, kremičník* versus *karbid* and *silicid*).

Ultimately, it follows from the basic thesis that a term is the naming of a concept on the basis of intension and extension properties and the meaning of the term cannot be distinguished in the text as P. Auger argues (according to J. Filipec, 1994).

Although it is possible to construct the responses:

The roots are necessary supplying devices of plants.
The roots of our statehood date back to the remote past.
The roots of words are often subject to alternations.
The roots of the nose are typical features of the race

and from their analysis the conclusion can be drawn that in each case it is actually a different meaning of the word "root", i.e. its use in the function of the term in botany, history, linguistics, and biology, but different meanings are involved only from the point of view of language, language of special purpose in the marginal case. Actually it concerns the semantic and language or linguistic viewpoints.

From the terminological perspective the question should be posed differently. It is not the ready text that should be the starting point but the way of its creation. The author of the specialized text, e.g. of the account should know which means of expression should be used so as to denote the concept correctly and to refer to the object about which it is spoken. The correctness cannot be looked for in the texts of language dictionaries but in the system of concepts of the particular scientific field. It is not sufficient to verify the correctness of this choice by the possibilities of the replacement of a term by another one but by a reference to the system of concepts.

Naturally, this knowledge need not be always primary, direct, gained by the knowing activities of the text producer but it can also be mediated, acquired through studying the particular discipline or the literature on the subject.

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