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SOME BASIC CONCEPTS OF TERMINOLOGY: TRADITIONS AND INNOVATIONS

For 70 years, since terminology science was singled out as an independent discipline and sphere of activities in the former USSR, it has covered a long way – from tiny sections in publications on lexicology in academic linguistic treatises and sporadic remarks in the works by representatives of natural and technical sciences to the ramified science which employs modern achievements of human cognition in cognitive terminology science, from understanding of terms as a periphery of lexis within national languages to the description of terms as the most important lexical class in the Languages for Specific Purposes (LSP), without which modern culture could hardly exist. In this presentation an attempt is made to exhibit the present state of art in Russian terminology science with special reference to its basic concepts and categories included in the foundation of theoretical and applied terminological activity.

1. CONCEPT VS. NOTION

Up to the 80-s of the XX century the terms "notion" and "concept" were used synonymously, but "notion" was used much more often within the Russian scientific tradition.

Yu. S. Stepanov, the outstanding Russian linguist, writes in the "Linguistic Encyclopeadic Dictionary": "Notion (concept) is the same phenomenon as the meaning of a word but it is considered in some other system of connections: meaning – in the language system, notion – in the system of logical relations and forms which are investigated in the language study as well as in logic" [Stepanov 1990]. At the same time a French scholar, A. Rey, claims in his book "La ter-minologie: noms et notions" that the word as well as the term is correlated with a notion, and the concept is not even mentioned [Rey 1979].
However, in the 80-90s of the previous century, the linguistic term "notion" and "concept" appeared to be interpreted quite differently in works by Western scientists as opposed to those of Russian scientists.

On the one hand, cognitive science in the West was dealing with the problems of knowledge representation in man's mind and knowledge structures in language. In Russia, we had such publications as "The Human Factor in the Language" (Moscow, 1991) and "The Language and the World Picture" (Moscow, 1991). In these publications, differences between notions and concepts were discussed on the basis of a differentiation between linguistic and mental world pictures, which resulted in different naming of these phenomena. The units of the operative conscious we work with at the mental level were called concepts. Concepts are born as a result of observations of objects and phenomena in the surrounding world, of their classification and categorization.

On the other hand, in the works by German and English specialists on Languages for Specific Purposes (LSP) and the Russian followers of the LSP theory there appeared a division of logical notions as the products of logical cognition, which are differentiated by the highest degree of abstraction (compare: big, medium and small terms in syllogisms), and special concepts which circulate in the subject sciences as opposed to methodological sciences; i.e. concepts which are designated by means of special terms.

Thus, in Russian scientific tradition the word "notion" is attributed to Logic, and the word "concept" is used in different sciences in two different meanings. The first meaning is typical of cognitive science and cognitive linguistics. Here the term "concept" is a designation of the results of mental activity. Here the concepts are fuzzy and diffuse and may be used to indicate not necessarily substantial features of objects. The identification of objects by means of concepts is highly individual since a person selects from the outside (objective) world what he needs.

In terminology science, including cognitive terminology science, the second meaning has been established: here the word "concept" is used to denote the results of mental procedures in specific (scientific, technical, etc) knowledge, more or less precise mental units designated by the terms of the subject sciences.
Nevertheless, it will be fair to mention that in the works by the first Russian terminologists it was claimed that terms denoted and expressed notions – D.S. Lotte, E.K.Drezen, G.O. Vinokur did without concepts. It should also be stressed that the controversy "notion – concept" is still widely discussed and that there is no generally accepted agreement on differences between notion and concept. Thus to some researchers, what distinguishes notions and concepts is the static nature of notions and the dynamic nature of concepts, which are clarified only within the boundaries of the text [Alexeeva 1998]; to others, it is mostly the more or less precise meaning of notions and the rather vague and fuzzy intension of concepts, of which very blurred boundaries admitting several quantitatively different interpretations are typical [Shelov 1998]. The controversy between notion and concept has given rise to a new research direction of terminology studies, called cognitive terminology.

2. TERM

In Russian terminology science, one can find dozens of definitions of the concept "term". In a monograph by V.P.Danilenko there are 19 definitions of the term [Danilenko 1977]. During recent years, their number has greatly increased. Some authors add in their definitions new attributes of the term, determined by the meaning accepted by them [Melnikov 1991; Grinev 1993].

The simplest definition of a "term" given in the "Dictionary of Linguistic Terms" by O.S. Akhmanova [1966], who claims that a term is "a word or a word combination of some specific (scientific, technical, etc) language created (accepted, borrowed, etc) to define precisely some special notions and to designate special objects; compare nomenclature". Some other much more sophisticated definitions take into consideration the linguistic and logic

nature of the term, the systematic nature of terminology, the formal and functional structure of a term etc.

In particular, a protracted discussion took place between adherents of D.S. Lotte (conventionally regarded as proper terminologists) and those of G.O.Vinokur (conventional linguists).

D.S.Lotte held the view that the term is a special word [Lotte 1961; 1971; 1982], and G.O. Vinokur considered "the term to be not a special word, but only a word with the specific function", and claimed that "any word could perform a role of a term, however trivial this word might be" [Vinokur 1939]. The disagreement can be reconciled if we proceed from the assumption that the term borrows from the lexical unit of a natural language only what can be called its language substratum, and that the principal nature of the term resides in its terminological nature, i.e. its ability to designate a specific concept in the system of all the concepts within a particular area of knowledge or activity. In most cases we may assume that attributes of the strict logical concept are imposed "from above" on the substance of the term and that consequently the term represents a compound multi-strata product in which the natural language substratum and the logical superstratum are both present. Accordingly, they form "bottom" and "top" strata, enclosing the "core of the term" with its specific conceptual, functional, and formal structure which interact with the language substratum and the logical superstratum [Leitchik 1986].

In the publications [Shelov 1982; Chelov 1986; Shelov 1998] it was assumed that the nature of the term can be characterised in the following way: a. it is a concept denoted by a lexical item (word or word combination) that makes this item a term, b."the degree of termness" of an item (= the quality of being a term) is determined by all items necessary for the identification of its concept within the whole system of definitions (explanations) of these items, belonging to the domain under consideration, c. the more information is required in a definition (explanation) to identify a concept, denoted by a certain item, the greater the "degree of termness" of this item.

Two theses are most important for the interpretation of "the degree of termness" above: 1. the term is inherently different from the common word and word combination of the concept it denotes, 2. the concept of termness is postulated as purely relative since some lexical items are declared to be "more terms" and the others are declared to be "less terms".

This understanding of the degree of termness is in agreement with the views according to which "the meaning of the term is its place in the theory", stated in studies by O.S. Achmanova [Achmanova 1966], A.A.Reformatsky [Reformatsky 1959; Reformatsky 1968,] and A.V. Isachenko [Isachenko 1962]. In particular, according to proposition c., any word or phrase is more terminological in proportion to the number of words and phrases involved in its definition; the augmentation of scientific theory with new terms which express general fundamental concepts and through which some existing terms are redefined increases the degree of termness of all other terms (whose definitions remained unchanged) etc.

2.1. Term motivation

There is a tendency to treat the problem of term motivation as an integral part of the problem of the term itself. Term motivation has been studied in depth by many terminologists, including researchers from East European countries of the former USSR [Kandelaki 1977, Skorohod'ko 1983, Kyyak 1988]. At the lexical level, some terms have been convincingly demonstrated to be completely motivated and, consequently, lacking no definition at all [Shelov 1998; Shelov 2002a]. Those terms are usually characterised as completely motivated, i.e. their concept is absolutely motivated by their constituents.

Some term constituents were treated by D.S. Lotte as terminological elements of terms [Lotte 1961; Lotte 1971]. The concept of 'subterm' as a term component of a separate terminological unit has been introduced in the publications [Shelov 1998; Shelov 2002a]. Some lexical constituents absolutely motivate the conceptual contents of the terms, which therefore lack no definition.

If not fully motivated by its constituents, the term must be defined (otherwise its concept remains uncertain); full motivation of a term by means of its direct or indirect (implied) constituents actually plays the role of a definition, thereby making the latter absolutely superfluous.

3. TERMINOLOGICAL DEFINITION

According to A. Rey, "term definition is probably the very centre of terminological problems" [Rey 1979]. Recent publications in terminology research distinctly demonstrate constantly growing interest in the problem of term definition analysis. A very useful and authoritative anthology on the matter froma philosophical point of view edited by J.C. Sager has appeared recently [Essays on definition 2000]). Besides, the ever growing interest in terminological definitions could be at least partly explained by the facilities that information and term databases may offer in case proper conceptual analysis is applied to terminological definitions, providing a database with highly reliable data in a well structured and machine-readable form. The opportunity to get most important pieces of information directly from definitions opens rather promising perspectives in new computer technologies [Jose, Finatto 1995; Martin 1992; Meyer, Bowker, Eck 1992; Pozzi 2001; Sager, L'Homme 1994; Sager, Ndi-Kimbi 1995].

Like any definition and unlike any affirmation, the terminological definition cannot be true or false – defining is a speech act aimed at obtaining common word usage. The producer of a definition simply invites an interlocutor to keep to the same concepts while using the same linguistic units; thus a definition is valid as a naming act, being a kind of performative utterance as discussed extensively by linguists since J. Austin. As any definition is absolutely invulnerable from the point of view of being true or false, the interlocutor cannot criticise it for being false or praise it for being true. But a definition is very sensible to some other criteria, linguistic and logical arguments being basically involved. So the interlocutor might

still consider the definition proposed absolutely useless or even as making clear things unclear and obscure, and might on this basis completely reject it.

Definitions outline the conceptual limits of terms and set up their logical and conceptual relations. It has recently been proposed that a distinction should be made between a proper term definition, definition in the narrow sense of the word (opredelenije, definitsija – in Russian), and some other types of term concept explanations which were then to be called exposition (tolkovanije – in Russian) [Leichik, Shelov 1991; Shelov 1998; 2000; 2001]. The following two observations are most important.

First, expositions are very typical of the way in which basic and most principal, "first level" terms of any scientific discipline are explained. Expositions make the corresponding terms qualitatively vague and uncertain: cf. linguistic unit, linguistic category in linguistics, style, genre, literature in literary science, concept, cognition, thought in cognitive sciences, life, organism in biology, facies in geology, etc. are very good illustrations of what is meant.

Second, the difference between pure definition and exposition brings us back to the controversy between the notion and the concept, seeing that presumably the proper definition coins the notion of the term whereas the exposition coins the conccept of the term. The structure of the expression by means of which any term is defined (Dfn) is much more complex and sophisticated than that of the term itself (Dfd). This expression cannot simply be a reference to any other terminological unit; moreover it cannot be as syncretic as a Dfd term itself, – if so, it would have no explanatory power. So, among other means of explanation of term meaning, term definition seems to occupy the central position. In normative terminological dictionaries and standards there is a steady tendency to use almost exclusively definitions in the narrow sense. In ordinary terminological dictionaries both definitions (in the narrow sense) and expositions are used.

A terminological definition in the broad sense of the word is an explanation of the conceptual contents of a Dfd term. However different term definitions are, when defining terms we always first aim at disclosing the conceptual contents of a Dfd lexical item, and secondly at applying the cognitive function of this disclosure. Terminological definitions cover both proper definitions (definitions in the narrow sense of the word) and expositions.

The proper definition should be classed among performative utterances considered by its author be a definition, and as not admitting different qualitative interpretations (within the limits of the chosen initial concepts). A verbal term definition (in the narrow sense) is a performative utterance prescribing a concept to a Dfd term by indicating its position among other (specific as well as non-specific) concepts of a domain. As soon as an explanation of the term concept admits different qua-litative interpretations, it loses its status of definition and turns into an exposition. However, the role of expositions is very important since they preserve the unity, integrity and continuity of science at the upper levels of concepts.

4. TERMINOLOGICAL SEMANTIC STRUCTURE VS. TERMINOLOGICAL CONCEPTUAL STRUCTURE; TERMINOLOGICAL FIELD

Linguistics deals mainly with what it calls the semantic structure of linguistic units. Consequently, the semantic structure of terminology covers all kinds of semantic relations between two terms, one of which is derived from the other (in a very broad sense of the word). These relations may be specific to the domain within which these terms function, as well as not specific and highly typical of the common language. The latter can be perceived as morphological, syntactic, or semantic "operators" applied to some primary terminological items in order to derive new ones so that these new lexical items may function as terms according to the common language grammar, whereas no specific “conceptual addendum” is involved by means of the operator. A set of semantic relations between the terminological units mentioned above is no doubt a part of the semantic structure of the corresponding terminology, but it has nothing to do with the conceptual structure of the corresponding terminology since these relations exist at the level of common language.

As far as the conceptual structure of terminology is concerned, it deals only with one part of the semantic relations – the one which needs particular specification and clarification [Nuopponen 1994]. The following view is accepted in the publication [Stupin 1971; Shelov 1998; 2000; 2001].

The conceptual structure of terminology is a special case of semantic structure. It is a structure of all conceptual relations between two (or more) terms, of which one is directly motivated or defined through the other in the corresponding domain.
Since terms are the most informative lexical units of a special text and serve as designations of specific concepts of science and technology, descriptions of a term definition system and its conceptual aspects establish a logical-semantic structure of terminology, cf. with the concepts of “logical scheme of science” and “logical form of understanding the world”, discussed by D.S. Lotte [Lotte 1961]. In the works previously mentioned, it has been demonstrated that definability of terms through other terms (i.e. facts of one terms being defined through the others) is extremely important for simulating terminological properties of words and phrases.

So formally, the conceptual structure of terminology may be represented by an (oriented) graph which implements the relation of direct definability or motivation between terms and the conceptual interpretation of the relation in question.

Part of the conceptual structure which relates to a separate term makes up its terminological field, and a set of all terminological fields will actually present the conceptual structure of terminology. It is worth noting that the nearest generic concept, the specific attributes and concepts (and, accordingly, the terminological conceptual hierarchy in general) are not established "locally", proceeding from the text of a single separate term definition; this procedure "is global", in view of all sets of definitions. This hierarchy covers terminological units, which have definitions, and the nature of the relations between them is completely determined by the contents of the appropriate definitions.

What is stated above is true only if we have no expositions admitting qualitatively different interpretations. Otherwise every new interpretation could, strictly speaking, generate a new conceptual structure of terminology, related to the same subject field (that is the case we realise as soon as we are confronted by a newly developed theory in the same subject field).

5. TERMINOLOGY VS. TERMINOLOGY SYSTEM

In the 70ies of the XX century the peak of interest towards system character of terminology could be observed and that was connected with the popularity of the biologist L.fon Bertalanffy. This scientist suggested the programme of building general theory of systems, which contained general principles and laws of the systems behaviour no matter what elements and the relationships between them were. The dissertation of L. fon Bertalanffy was translated into Russian in 1969 [Bertalanffy 1969].

The modern Russian term study admits two kinds of the totality of terms, - those are terminologies and terminology systems. The common feature of both of them is that they both comprise lexical units of the LSP, which are functional varieties of the modern developed national languages serving specific domains (science, industry, economics, politics, etc).

The difference between terminology system and terminology is, first of all, in the way they come into being. Terminology appears spontaneously as a result of knowledge accumulation and appearance of special notions and concepts. Terminology system is constructed on purpose after a theory was developed that describes and explains regularities, objects, processes and attributes of objects and a system of corresponding concepts was composed in a specific sphere.

Hence it follows that before a terminology system is developed there should definitely exist some theory. In fact, there are some fundamental differences between terminology and terminology system. Terminology enters the mental world far from being accomplished and crowned; its lexical units are very far from being strictly systematic, they form some homonymous, synonymous and polysemantic series. Only in course of unification/standardization terms undergo some changes that enhance their system qualities. In other words, it takes much time before terminology turns into terminology system and this happens (if ever) at a rather advanced stage of knowledge development (this is stated explicitly in methodological recommendations on the terminology standards development). So a terminology system is more than a set of ordered terms: it is actually a logic-linguistic model of a theory within a subject field. Thus, unification of terminology system is based on the difference between the two basic sets of terms – terminology and terminology system [Leitchik, 2000]. According to this approach, terminology system is completely isomorphic to the system of concepts and ter-minology is not. However terminology may continue to develop language-wise, independently of the respective system of concepts, lagging behind or stepping ahead of it.

6. TERMINOLOGY VS NOMENCLATURE

In common usage, nomenclature is often a synonym of terminology. In scientific tradition, however, the word "nomenclature" seems to be used in a more specific sense, and contraposition of nomenclature and terminology can be found. The controversy “terminology VS nomenclature” is very typical of Russian terminology research after seminal ideas of A.A. Reformatsky.

This presentation does not claim to cover the subject completely but attempts to review the most common approaches to nomenclature as opposed to terminology, since terminology and nomenclature are considered to be the most part of the scientific vocabulary [Whewell 1867; Mill 1843, Nilsson 1974; Vinokur 1939; Reformatski 1959; Achmanova 1966; Leichik 1974; Zabin-kova 1976; Bereznikova 1976, Shelov 1985].

At least three different notions of nomenclature can be formulated: 1. nomenclature as a set of scientific and popular names for members of the plant and animal kingdom (nomenclature 1); 2. nomenclature as a set of designations of “lower natural subdivision” (nomenclature 2); 3. nomenclature as a set of conventional notations (nomenclature 3).

The different interpretations of nomenclature represent different scientific traditions. Nomen-clature 1 goes back to the times of K.Linneus and his invention of binary nomenclature for biological species and his indisputable success in attempts of setting it up in denoting subjects of the Nature.

The concept of nomenclature 2 was given birth in scientific practice by philosophical recognition of this fact and meditations over it. W. Whewell and J.S. Mill are the most worth mentioning among others for general discussion of the "nomenclature VS terminology" controversy and its theoretical foundation. Though not completely consistent, this controversy was generalised to most part of the names for chemical elements and some far reaching perspectives on this basis were outlined in distinguishing between empirical and theoretical terms of science.

Nomenclature 3 is usually under consideration of linguists. The use of alphabetic, digital, and alphanumeric systems of symbols is a typical feature of nomenclature 3. Proper names are also used to coin nomenclature 3. It is the most intriguing how these notations come into being and get familiar within the same LSP community.

Different interpretations of nomenclature are not, however, totally unrelated. In fact they have much in common as they are described in the literature. Though separating them from one another is rather difficult, different historic roots can be traced up to nowadays.

Within the framework of the LSP theory which is being developed in Russia (Denisov 1974; Stepanov 1983; Leichik 1974; 1981) it is claimed that nomenclature is one of the three classes of LSP lexis: 1. common nouns and terms which denote general concepts; 2. proper names which denote unique concepts (i.e. the United Nations Organization, the planet Jupiter); 3. nomens denoting particular concepts making up the intermediate class between

common nouns and proper nouns (i.e. an automobile Opel-Kapitan, sweets Merci, a washing-machine Candy Automatic ets). Nomens are conventional notations from linguistic point of view and non-conventional notations from cognitive point of view: they are necessary to describe specific sphere of knowledge and activity. The theory of nomenclature adjoins terminology studies.

7. TERM STANDARDISATION AND UNIFICATION

The unification of terms and their combinations is one of the most important part of the practical terminological activity and one of the branches of the applied terminology studies. Practical terminological activity has two mutual aspects: optimizational and normative [Felber, 1984]. On the one hand, its aim is to substantiate the choice of "optimal terms with optimal meanings", in other words, terms that meet the requirements of the adequate nomination of objects, processes and attributes in the specific domain.

On the other hand, the terms and their definitions selected as "optimal" are entered up in the normative documents and instructions (standards, normative dictionaries, editors' directions, etc) and, thus, acquire legal status. The unification of terms which includes, as a rule, the whole totality of terms (terminology or a terminological system) has a very important function – the one of systematization. Elaboration of methodized and unified terminological system results in the fact that every conceptual place is occupied by a single lexical unit with one only one definition relating to the corresponding concept, it also leads to the systematization of all the sign means which refer to some particular sphere of knowledge and activity.

Types of term unification vary with the sphere of knowledge or activity or other settings; nowadays in Russia there are four types of term unification products: 1. standards for terms and term definitions and terminological applications to the standards of other categories, 2. collections of recommended terms, 3. normative dictionaries; 4. harmonized terminology.

1. Up to the beginning of the XXI century there were in action more than 20 thousand standards for terms and term definitions. The most part of them make up national standards (there are more than 800 of them valid up to now at the national level in Russia). There are also international ISO standards, regional standards, standards of firms and international organizations. The majority of requirements articulated in terminological standards are compulsory for use in some types of documents and papers.

In Russia the institute of VNIIKI of Russian Federation is responsible for terminological standardization at the state level. The firms' terminological standards are worked out and applied in individual industrial companies.

However there is a stable tendency of convergence of the Russian standardization system with the kindred systems in some other industrially developed countries and international organizations. This tendency is well reflected in the project of the federal law on "The basis of technical regulation in Russian Federation". And it looks like modern trend both in Rus-

sian and Western standardization systems to soften their standard requirements and to transfer from strict demands and requirements to recommendations.

2. Collections of recommended terms include scientific and scientific-technical terms which refer to the complex mostly scientific spheres of knowledge (mining, chemistry, building, economics, robotics and others). In Russia such documents are worked out by the Committee for Scientific Terminology in Fundamental Research of the Russian Academy of Sciences. By the end of the XX century the number of these collections achieved 120 with the total number of 25000 recommended terms. This type of unification has acquired regulating status [Brief Work-Book on Development and Ordering of Scientific and Technical Terminology, 1979]. In this type of terminological reference books, as well as in terminological standards, a systematic arrangement of the entries is used. While using these terms the degree of obligation to meet the requirements of recommendation is lower than in the standard prescriptions though the principle of unification is fully preserved.

3. In normative dictionaries the level of obligation is even lower. Nevertheless, this type of term unification has become widely spread since communication between scientists, politicians, diplomats and lawyers without unified and methodized terminology entered up in documents and papers in various spheres of industrial and social activity is very problematic. The most well-known normative dictionary is the International Dictionary of Electrotechniques which is being created in different languages by the International Electrotechnical Committee and which covers terms of physics, electronics, communication etc (more than 100 volumes). The whole of it was translated into Russian.

4. In the process of harmonization the unification of terms is restricted by the reciprocal coordination of terms and terminologies, taking into consideration the national language structures, systems of special concepts, which in its turn depend on the theory, conception, system of views popular in this or that scientific school.

While harmonizing terms and terminologies two groups of factors should be considered: linguistic factors, affecting peculiarities of the languages to which the terms are applied, and ex-tralinguistic factors, affecting the subject sphere and the theory it describes. The preconditions for term harmonization are the integration of knowledge, internationalization of science and technology as well as their globalization, including the active internationalization of terms.

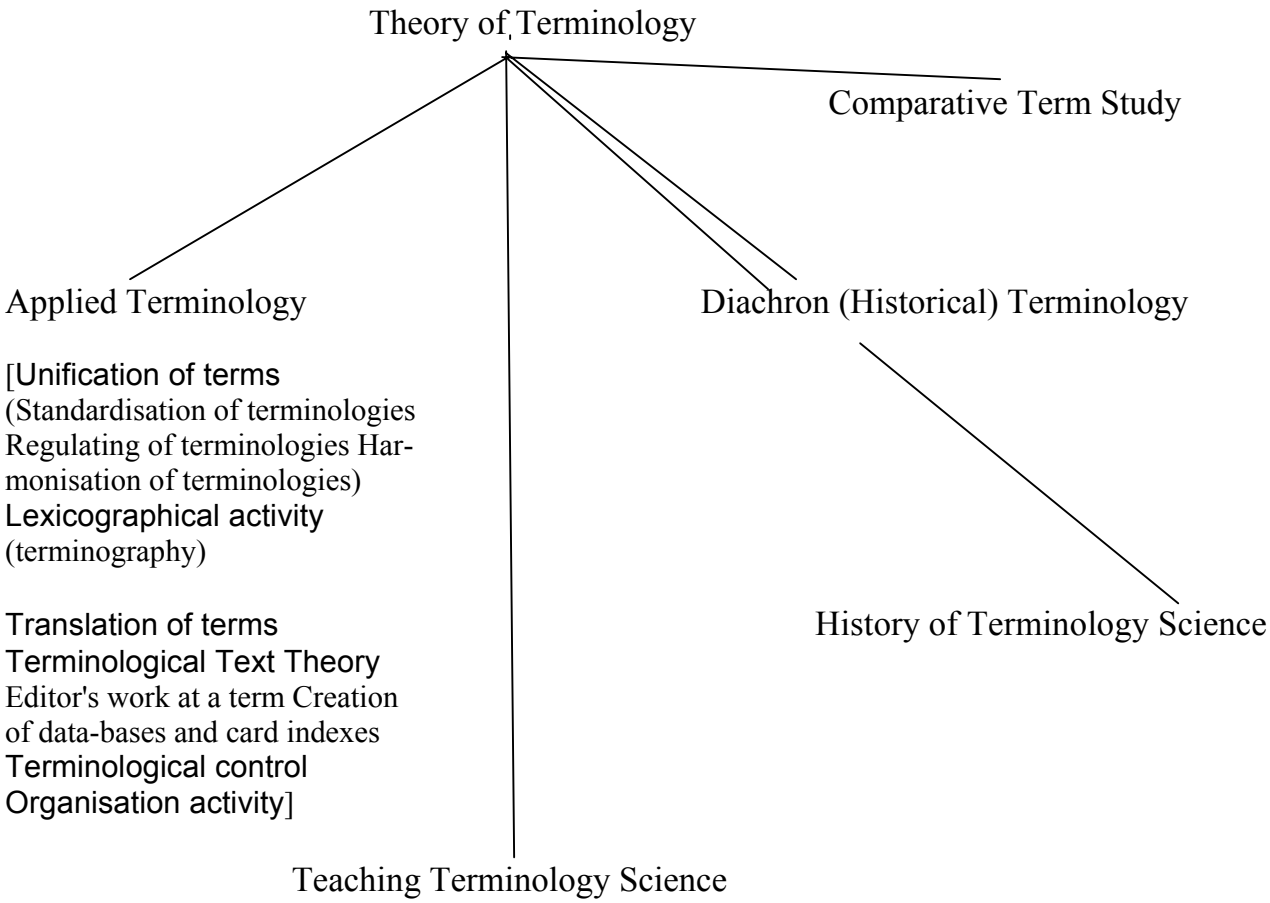
8. CONCLUSION

The history of the Russian terminology is greatly influenced by D.S. Lotte, E.K. Drezen, AA. Reformatsky and G.O. Vinokur, whom we take as classics of domestic terminology and whose views in its turn were influenced by Austran-German terminological school, and particularly by E. Wьster. The present state of the Russian terminology is reviewed in more details in our common article with Mr. Leitchik [Leitchik, Shelov 2003].

Nowadays quite various methods are applied to solve different problems of terminological theory and practice. Some philosophical ideas typical of the Russian terminology scool have been just mentioned at our previous session; some lexicographic methods and there application with respect to terminolgy in computer science will be respected in our presentation with Mrs. L. Tkacheva. Some new ieas of cognitive terminology have been actively eveloping and that will be witnessed by Mrs. L.Manerko presentation.

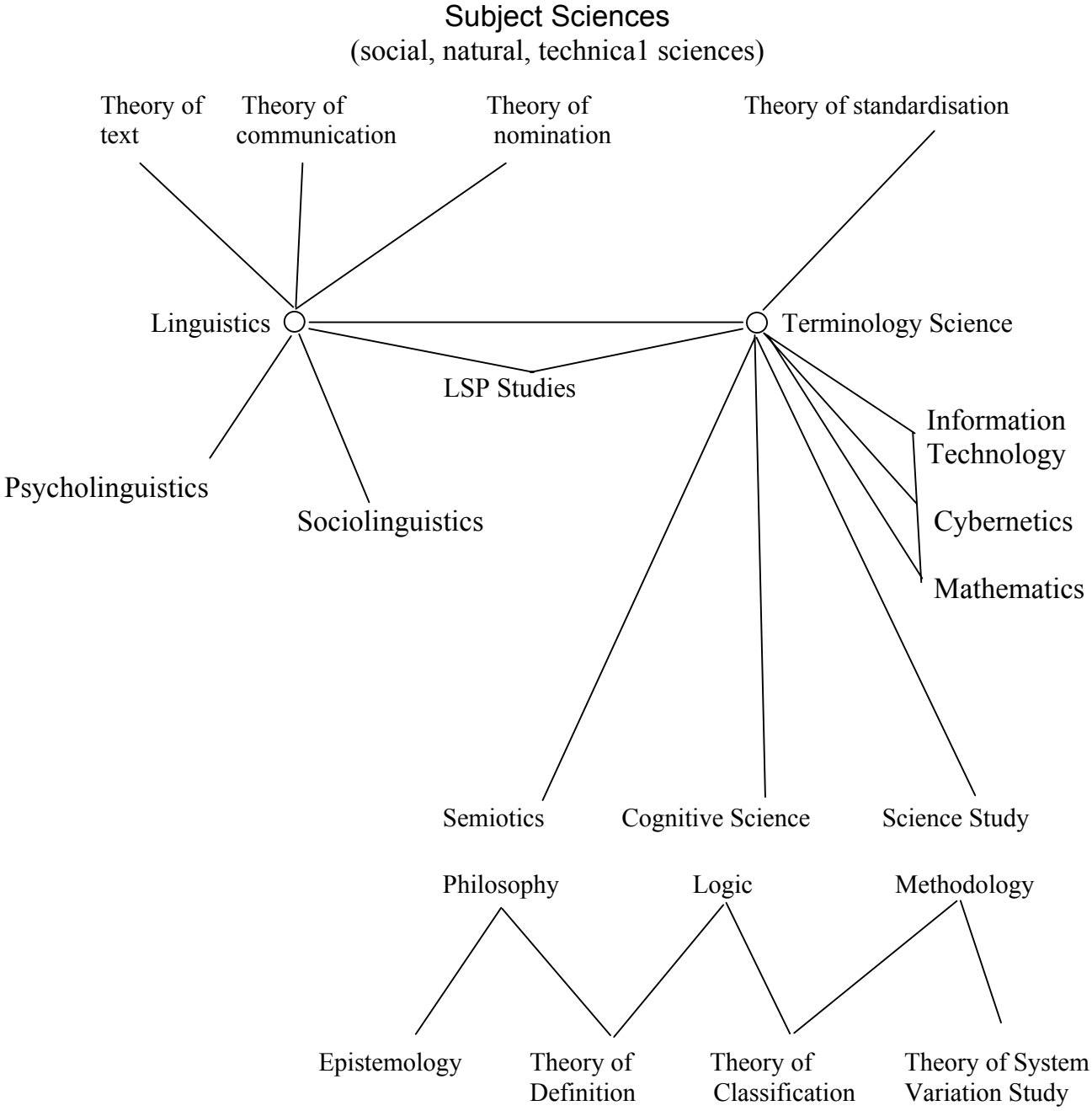
Terminology is no more a part of linguistics but an inependent theoretical and practical domain with a structure of its own, with its own subject and methods. The subject of terminology is very close to LSP's subject but does not coincide with it. You can see the structure of terminological stidies in the ex-USSR and Russia at the fig. 1 below.

FIGURE 1 STRUCTURE OF TERMINOLOGY SCIENCE IN RUSSIA (The Soviet Terminology School)



Terminology science takes its own position within the framework of modern scientific knowledge. E. Wüster mentioned five domains in his famous article of 1974 that have closest correlations with terminology – Sprachwissenschaft, Logik, Ontologie, Informatik and Sachwissenschaften. According to the Russian terminology school, terminology has considerably more connections with basic and adjacent domains. They are presented in fig. 2 below.

FIGURE 2 THE PLACE OF TERMINOLOGY SCIENCE IN THE SYSTEM OF CONTEMPORARY SCIENCES



There are grounds to hope that these connections will expand even more widely and result in new applications and solutions. We witness this expansion as the year of 2002 was called by the UNESCO the year of Terminology.

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