THE ANALYSIS OF ANTHROPOTOPONYMIC AND TERMINOLOGICAL STRUCTURES IN ENGLISH SCIENTIFIC AND TECHNOLOGICAL DISCOURSE

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Abstract:*The authors of this paper study the anthropotoponymic and terminological structures of English scientific and technological discourse (the sphere of nanotechnology and fibre optic technology). The structural peculiarities of anthroponyms, eponyms, toponyms, terms and terminological word-combinations are examined. The classification of the mentioned above lexical units according to their numerical composition is provided.*

Key-words: *scientific and technical discourse; anthroponym; eponym; toponym; term; terminological word combination;*

English scientific and technological discourse is studied in this paper. This kind of discourse is characterized by using great amount of anthropotoponymic and terminological structures. The first one includes anthroponyms, eponyms and toponyms while the second one consists of terms and terminological word combinations. The aim of the paper is to provide the structural analysis of the mentioned above items.

The authors of the paper have made an interpretation of 576 pages of English scientific and technological discourse (the sphere of nanotechnology and fibre optic technology). Among them there are the following articles: S. Arayachukiat [1], J.-M. Beaufils [2], M.A. Castrillon [3], S. Gupta [7], M. Heurlin [8], M. Nakazawa [19], A. Priyadarshi [21], P.D. Townsend [25], H. Wei [28] and monographies: S. Kelley [10] и F. Mitschke [17]. In the course of the analysis 665 text passages (the average length of each is mostly one sentence (simple or compound)) have been picked out by the means of the continuous sampling method. Anthropotoponymic structures make 49 % while terminological ones 51%.

Let us pay attention to the theoretical side of the issue and cover such concepts as “anthroponym”, “anthroponomy”, “eponym”, “eponimy”, “toponym”, “term” and “terminological unit”.

Anthroponomy (from Greek “anthropos” – man and “onyma” – name) is a branch of onomastics, studying anthroponyms, patronyms, surnames, patronimics, nicknames, pseudonyms, cryptonyms and anthroponyms of the literary work [20]. T.V. Myaskovskaya and V.V. Semina have proposed the following classification: personal name (the name given at the birth), patronymic name (the name after your father, grandfather and so on), surname (family name), nickname, pseudonym (individual and group), cryptonym (a hidden name), anthroponyms formed from ethnicons (the names of natios) [18, p.52]. It should be noticed that not all of the mentioned above types are reflected in the studied discourse. This is explained by the chastity and officialism of the last one. In the act of the textual analysis it was determined that only the following structures such as “name”, “surname”, “initials+surname”, “name+surname”, “name+numeral”, “name+middle name+surname” and “position (degree)+name (initials)+surname”.

The works of E.V. Varnavskaya [27], D. Minkova and R. Stockwell [16] as well as the other’s ones are devoted to the study of eponyms. According to E.V. Varnavskaya, eponimy is “a nomination of things and events after real and mythic characters widely used while calling geographic features, rewards, film companies and industrial groups” [27, p. 9].

One more definition was provided by D. Minkova and R. Stockwell: "These are new words based on names (epi- 'upon' onym 'name')" [16, p. 19]. The text study has allowed to make the following eponymic models classification: N (Noun), Anthr.+N (Anthroponym+Noun), Anthr.+Anthr.+N (Anthroponym+Anthroponym+Noun), Anthr.suf.+N (Anthroponym complicated with a suffix+Noun), Anthr.'s+N (Anthroponym complicated by possessiveness), eponyms-units of measure and eponyms-abbreviations.

Toponyms have been studied by such language scholars as A.V. Syperanskaya [24], L.V. Uspenski [26], R. Coats [4], M. Gelling [5], C. Smith [23] and the others. Toponyms are the names of geographic features. There are a lot of toponyms classifications. However, as the study material of this paper is scientific and technical discourse, let us consider the most convenient ones for its research. There are two appropriate ones. One of them is based on the morphologic structure (Leonovich 2002), the second one correlates with the type of the denoted geographic features (Syperanskaya 1984). According to the morphologic structure, O.A. Leonovich divides toponyms into four groups: "simple toponyms" (one base morpheme), "secondary toponyms" (one base morpheme + suffix), "complex toponyms" (two base morphemes) and "composite toponyms" (two and more words) [13, p.66]. A.V. Superanskaya offered a division based on the type of the denoted geographic features. They are hydronyms (water object names), oronyms (mountains names), placenames (cities names), urbanonyms (intra-city objects names), macrotoponyms (the names of big geographic features such as countries and so on) and microtoponyms (small undeveloped lands) [24].

Any scientific and technical text is full of terms. There had been a critical problem of the defining such a concept as "term" until the middle of 1970s. Later the language scholars came to the common conclusion that terms are "words and word combinations connected to the concept related to any field of knowledge and activity" [6, p. 24]. Nowadays terminological word combinations prevail in the texts of scientific and technical discourse due to the science acceleration and the growth of the scientific knowledge. A terminological word combination is "a semantically integral combination formed by joining two, three or more components related to a certain science and engineering concept [12, p. 5]. Terminological word combinations can be two-component, three-component and complex ones. Moreover, the components bond character varies. Such parts of speech as nouns (N), adjectives (Adj.), verbs (V), prepositions (prep.), numerals (Num.) and adverbs (Adv.) can act as constituent parts of terminological word combinations.

All examined anthropotoponymic and terminological structures were divided into four groups:

1) simple ones;
2) two-component ones;
3) three-component ones;
4) complex ones (four and more components).

Let us consider each of them in details.

Simple structures

Ex. 1 *For example, large optical gain has been obtained by* ***Klimov*** *and coworkers using chemically synthesized NCs, which allows the application of these NCs in the field of quantum-dot lasers* [28, p. 496]. The Anthroponymic structure is "surname". The large optical gain obtained by Klimov and his coworkers is described in Ex. 1. Such a discovery allows nanocrystals to be used in the science field studying quantum-dot lasers.

Ex. 2 *Rather than expressing the energy in **Joules**, it can be interesting to write it as photon number which is found …* [17, p. 168]. There is a full name of the unit of measure in Ex. 2. There is also a short version of it, J. It was named after James Joule, an English physicist [9].

Ex. 3 *In 1992/1993, the same technology is used in **the Pacific** for TPC-4* [17, p. 240]. "The Pacific" is a simple toponym, hydronym complicated by the definite article. The most important thing in such a sentence structure is a place, not the one who has performed the action.

Ex. 4 *In situ monitoring of nanowire growth is highly desirable because these **nanostructures** will play a key role in future semiconductor devices such as **lasers**, photovolvatic cells, **transistors**, and medical sensors* [8, p. 3597]. A term "laser" ia an acronym of a complex collocation "light amplification by stimulated emission of radiation". It dates back to 1960s. American scientists A. Shavlov and Ch. G. Towns as well as Russian scholars A.M. Prohorov and N.G. Basov made this device independently in 1958. A term "transistor" developed from a complex noun "transconductance" in 1940-s. This invention refers to the middle of the 20th century and William Bradford Shockley, an American physicist [22].

Two-component structure

Ex. 5 *In 1959, **Richard Feynman**, another Nobel Prize winner in Physics, proclaimed that there's plenty room at the bottom* [10, p. 5]. The word expression "another Nobel Prize winner in Physics" is used after the anthroponym "Richard Feynman". This stylistic tool is called parenthesis. The aim of its use is to provide the reader with extra information that promotes clear understanding of the described issues. Richard Feynman, an American physicist, a key person and the author of the lecture "There is a plenty room at the bottom". This lecture has become a start to the study of tiny things.

Ex. 6 *The performance of DWDM systems in PMD transmissions over long-haul fiber links is limited by the ASE noise and linear and nonlinear interference (NLI) caused by **Kerr effect** in the fiber* [3, p. 10]. Eponymic structure is "Anthr.+N" is used. Kerr effect was discovered by John Kerr, a Scottish physicist and a pioneer in the field of electro-optics in 1875 [11].

Ex. 7 *In the experiment shown in Fig. 10the PCS Alice and Bob are linked via 28 km of standard telecommunication fiber installed in the **Ipswich area** of BT's public network* [25, p. 345]. In this example "Alice and Bob" denotes transmitters in the Ipswich area (a composite placename) where a standard telecommunication fiber was installed.

Ex. 8 *Knowledge of the refractive index n of the **nanowire layer** is necessary for using this approach* [8, p. 3598]. Nanowire layer is a terminological word combination referring to the middle of 1990s when the scientists managed to make it. The creation work was a result of the cooperation of many people. That is why it is impossible to estimate the authorship of the term. A term "nanowire" is formed by a prefix "nano-" and a root "wire" (from old English "wīr" (wrinkle).

Three-component structure

Ex. 9***Dr. Subodh Mhaisalkar** is an Associate Professor at the School of Materials Engineering, Nanyang Technological University (NTU), Singapore* [21, p. 183]. Anthroponymic structure "degree+name+surname". This person is a professor in School of Materials Science and Engineering (Nanyang Technological University). In this example the reader is given extra-information about one of the authors of the article [15].

Ex. 10 *By interpolation between glass and air indices according to air fill fraction using the* ***Lorentz–Lorenz equation*** *one obtains the values indicated by arrows on the left* [17, p. 71]. Eponymic structure is "Anthr.+Anthr.+N". The Lorentz–Lorenz equation relates the refractive index of a substance to its polarizability. The Lorentz–Lorenz equation is named after the Danish mathematician and scientist Ludvig Lorenz, who published it in 1869, and the Dutch physicist Hendrik Lorentz, who discovered it independently in 1878 [14].

Ex. 11 *Later, a whole grid of such lines was built across* ***all of France****, eventually reaching a total length of 4800km (Fig. 1.1)* [17, p. 3-4]. A simple toponym, placename is used in this example. Due to this toponym an evaluation of the invention use area size is given. This invention is a telegraph.

Ex. 12 *It has also been reported that* ***dispersion-decreasing fiber (DDF)*** *can broaden the spectral width of the SC significantly more than* ***dispersion-shifted fiber (DSF)*** *or* ***dispersion-flattened fiber (DFF)***[19, p. 216]. All three terminological word combinations have the same structure N+Adj+N. The last-mentioned type of the fiber was started to use in commercial purposes in 1980s. The creators of the fiver are unknown. The work can have definitely been done by a group of scholars.

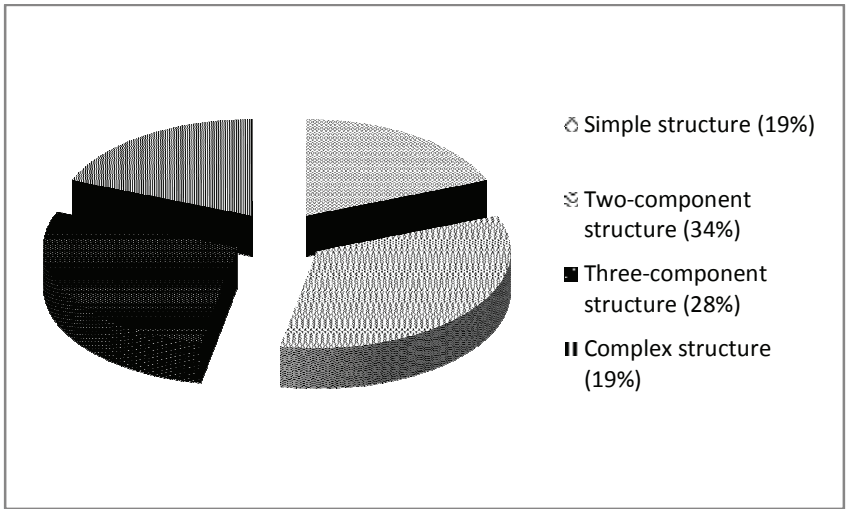
Composite structure (four and more components)

Ex. 13 *The authors thank NOVX Systems for providing the random optical add/drop switch (ROADX) that was used as transmission filter in the experiments and* ***Dr. Andrew J. Hudson*** *for his technical assistance* [7, p. 239]. Anthroponymic structure is "degree+name+initial+surname". The author of the article expresses acknowledgment to Dr. Andrew J. Hudson for his technical assistance.

Ex. 14 *Monitoring the Interaction between MPOCs and Lipid Bilayer Membrane by* ***Förster Resonance Energy Transfer (FRET)*** *Using Cell-Sized Liposomes* [1, p. 3372-3373]. The name of this physical phenomenon varies in the technical literature: Förster resonance energy transfer (FRET), fluorescence resonance energy transfer (FRET), resonance energy transfer (RET) or electronic energy transfer (EET). The scientific sphere gives preference to the term containing the name of the inventor. The phenomenon was named after Theodor Förster, aGerman physicist and chemist.

Ex. 15 *The sponsors' approach was initiated with the fiber-optic link around the globe (FLAG) system which came in service in November 1997, followed by projects like Southern Cross (****Australia-New Zealand-United States****)* … [2, p. 32]. The chain of macrotoponyms (Australia-New Zealand-United States) is used in Ex. 15 which denotes the place of the invention use. The last one is fiber-optic link joined the mentioned states.

Ex. 16 *The preparation of* ***white-light emitting materials*** *has developed rapidly in recent years due to their application in full color displays and illumination sources* [28, p. 497]. The term word-combination has the following components bond Adj+N+Adj+N. The author pays attention to the fact that the production of the materials illuminating white light has greatly increased within the last few years. So, the author evaluates the time and the procedure of their production.



Graph 1. The usage frequency of the anthropotonymic and terminological structures in English scientific and technical discourse

Having studied the anthropotoponymic and terminological structures in English scientific and technical discourse, the authors of this paper came to the following conclusions:
1) scientific and technical discourse is a complex interpretation product and as a result its texts are rich in complicated lexical material presented by anthropotoponymic and terminological structures;
2) all the anthropotonymic and terminological components of a scientific and technical discourse can be classified according to their structure. There are several types of them: simple, two-component, three-component and complex.
3) as it shown in Graph 1, the most wide-spread model is a two-component structure, then goes three-component one. Such frequency can be explained by the science acceleration and the science knowledge growth. As a result, all the lexical items of the studied scientific and technical discourse undergo added complexity.

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