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## TYPES OF SCIENTIFIC METAPHORS

### Типы научных метафор

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Since the origination of science settling problems related to translating scientific texts was one of the key tasks for linguists to accomplish. Using metaphors to attempt communicating necessary meaning in a more precise and intelligible way.

Scientists dispute about the nature of the term whether it can gain a degree of expression. Still famous Russian linguist I.R. Galperin writes that although terms are generally deprived of any emotionality they can acquire certain colouring in a scientific text. Moreover the process of a term formation deals with metaphoric imagining in most cases. It is due to the fact that metaphor can express a hypothesis specifying the way a person is to think about the phenomenon in question.

Metaphoric and metonymical way of creating new terms is underlined as well by A.D. Plisetskaya, who calls such terms trite metaphors. Apart from terms metaphors are used in scientific texts in order to describe different phenomenon which are not yet completely understood. In such cases elements of a spoken language are often used which adds to the stylistic colouring of the text. Alongside with this fact many researchers who studied scientific literature, such as I.R. Gumilyov, A.S. Chadskaya point out unique identity of major scientists' style of description, whose scientific works are written in a brilliant literary language.

Metaphors can be classified according to the degree of unexpectedness as I.R. Galperin offers: metaphors which possess extreme degree of unexpectedness are called genuine, and the ones often appear in texts and are sometimes fixed in dictionaries, the meaning of which are easily defined, are trite or dead. Sometimes trite metaphors are revived but with another shade of meaning alongside with the previous one, then they are called sustained or prolonged.

Consider scientific metaphors from the viewpoint of their structure I.V. Arnold singled out simple and extended metaphors, the former can consist of several words, so the difference between two is that extended metaphors consist of several words possessing metaphoric meaning each separately and contributing to one overall image.

There are other classifications, based on functional semantic status by N.D. Arutyunova or on the main function of metaphors by K.A. Alekseev, but in this research we chose Galperin's and Arnold's classifications because they are major researchers in this field and their classifications are the most fundamental.

In the result of the performed studies the following ration of metaphor types was established: trite metaphors are the most widespread in scientific texts, the ratio is about two thirds of all metaphors under investigation. Genuine metaphors are not so manifold, the number made up about one third of all metaphors.

As for simple metaphors their number prevailed over the number of extended ones the ratio is 3 to 1 respectively.

*«What is the structure of the RNA; is it single-chain or double-chain, and how is it related in its order of bases to the DNA?»*

The word «chain» is a term since it names a certain subject or a notion in this case a type of structure. This term is a trite metaphor, for its meaning is based on the comparison of the properties belonging to a chain in a literal meaning with the structure of a molecule. At the present situation the term is neutral within a scientific context, but at the moment of formation it carried some expression.

This term metaphor is simple by structure. A great number of such metaphors can be found in scientific text, for example, «stress» when it means pressure, «current» in electrophysics, «strange particle», «dangling bonds» and others. Verbs can also become trite or dead metaphors, for example the verb «bombard» in the following sentence:

*«When a good conductor such as aluminum is bombarded by fast electrons with just enough energy to remove an electron from a particular Al inner-core energy level, the vacant level left behind constitutes a hole in the inner-core band».*

*«In the realm of occupational health, much is unknown about the ways in which people may be exposed to nanomaterials through their manufacture and use in the workplace, and the potential health implications of such exposure».*

Here the metaphor «in the realm» is also an example of trite metaphors, but it is not a term, therefore it does not perform nominative function. Originally the word «realm» meant only «kingdom» or a «state», but gradually it acquired the meaning «sphere», «field», so the emotionality disappeared and the metaphor became trite.

*«Each letter represents six or seven «bits» of information».*

In this sentence both trite and genuine metaphors are used in one word «bits» through play of words, as the language unit «bits» mean two different things: firstly it is a small amount of something and secondly it is a unit of information in an electronic form. In the second case it is a term and is a trite metaphor but on the other hand it creates expression as a genuine metaphor.

*«If we wanted to make a computer that had all these marvelous extra qualitative abilities, we would have to make it, perhaps, the size of the Pentagon».*

The phrase «to make it, perhaps, the size of the Pentagon» is a genuine metaphor and carries a certain degree of stylistic colouring within a scientific text. Moreover it is extended as it is described later on in the text.

*«This has several disadvantages. First, it requires too much material; there may not be enough germanium in the world for all the transistors which would have to be put into this enormous thing. There is also the problem of heat generation and power consumption; TVA would be needed to run the computer. But an even more practical difficulty is that the computer would be limited to a certain speed. Because of its large size, there is finite time required to get the information from one place to another».*

One more example of a genuine metaphor: *«Nanobiotechnology will lead to the design of entirely new classes of micro- and nanofabricated devices and machines, the inspiration for which will be based on bio-structured machines, the use of biomolecules as building blocks, or the use of biosystems as the fabrication machinery».*

The word combination «building block» was created as a term in the sphere of building, but in this context it means an «element» or a «a component». On the account of this usage of a term from a different field of studies expression takes place. Although this metaphor is still genuine it appears in texts more and more often in this meaning and as the result it will soon lose its stylistic charge and become a trite one.

Trite metaphors are more widespread than genuine in scientific texts since usage of a vast number of terms is one of the most important characteristics of the scientific style, and many terms are formed through metaphoric meaning at the first stage of their origination. This fact is also motivated by the usage of set expressions, which lost their colouring.

Genuine metaphors are few, as figurativeness on its own account is a stranger to the scientific style, for the main communicative task of such texts is to transmit information in the shortest and most exact way possible. Though genuine metaphors appear in scientific texts bringing emotionality, because sometimes it is the only way to pass on the information which is not quite clear to the author himself. As for texts about nanotechnologies the usage of genuine metaphors is related to the description of sizes, since this science deals with extremely small sizes.

Simple metaphors outnumber extended ones, for trite metaphors are rarely extended and genuine metaphors can be of both types.

## **РОЛЬ АНАЛИЗА ЗНАЧЕНИЯ СЛОВА В ИССЛЕДОВАНИИ СТРУКТУРЫ И СОДЕРЖАНИЯ КОНЦЕПТА**

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Взаимоотношение терминов *концепт*, *понятие* и *значение* рассматривалось такими учеными, как Н. Н. Болдырев (2001), С. Г. Воркачев (2002) В. В. Колесов (2002), М.В. Пименова (2000), Ю. С. Степанов (2001), А.А. Худяков (1996) и др.

Прежде всего необходимо выяснить соотношение значения слова и концепта, репрезентированного этим словом. Следует отметить, что концепт представляет собой чувственный образ, к которому прикрепле-