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КУРСОВА РОБОТА
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**ОСОБЛИВОСТІ СЕМАНТИЧНОГО ТРАНСФЕРУ ТА ЗБЕРЕЖЕННЯ
ЗМІСТУ ПОВІДОМЛЕННЯ ПІД ЧАС ПЕРЕКЛАДУ НАУКОВИХ
СТАТЕЙ З АНГЛІЙСЬКОЇ НА УКРАЇНСЬКУ МОВУ**

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на курсову роботу з перекладу з англійської мови
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студент _____ курсу _____ групи, факультету германської філології і перекладу КНЛУ спеціальності **035 Філологія**, спеціалізації **035.041 Германські мови та літератури (переклад включно)**, перша – англійська, освітня програма **Англійська мова і друга іноземна мова: усний і письмовий переклад у бізнес-комунікації**

Тема роботи: Peculiarities of semantic transfer and preservation of message content during translation of scientific articles from English to Ukrainian

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3.	Написання вступу і висновків дослідження, оформлення курсової роботи і подача завершеної курсової роботи науковому керівнику для попереднього перегляду	28–31 березня 2024 р.	виконано
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INTRODUCTION

Translation of scientific articles requires meticulous attention to detail and a nuanced understanding of the subject matter to ensure accurate communication of ideas across linguistic boundaries. The focus of this coursework is on exploring the peculiarities associated with the semantic transfer and preservation of message content during the translation of scientific articles from English to Ukrainian.

Scientific discourse, marked by its precision and technicality, presents unique challenges for translators. The transfer of complex scientific concepts demands not only linguistic proficiency but also a deep comprehension of the underlying principles. This research delves into the intricacies of semantic transfer, examining how meaning is conveyed, adapted, and preserved in the target language. The specific language pair under consideration – English to Ukrainian – adds another layer of complexity due to linguistic and cultural variations.

The relevance of this research topic is underscored by the growing significance of cross-cultural communication in the scientific domain. In an era of global collaboration and information exchange, the translation of scientific articles from English to Ukrainian plays a crucial role in disseminating knowledge across linguistic and cultural boundaries.

The challenges associated with semantic transfer and message content preservation during translation are particularly pertinent. These challenges are not only linguistic but also involve navigating cultural nuances inherent in scientific discourse. Understanding how these challenges impact the accuracy of scientific communication is vital for ensuring the integrity and accessibility of research findings on a global scale. In essence, the relevance of this research extends beyond the immediate context of translation studies, encompassing broader implications for facilitating cross-cultural communication and promoting a more inclusive and collaborative global scientific community.

The aim of this research is to explore the peculiarities of semantic transfer and the preservation of message content during the translation of scientific articles

from English to Ukrainian. To achieve this goal, the following **specific objectives** will be addressed to:

- summarize an overview of general linguistic theories relevant to scientific translation.
- outline the specifics of scientific discourse, identifying its distinctive features.
- define lexical transformations encountered in the translation of scientific discourse.
- analyze grammatical transformations that occur during the translation of scientific discourse.
- highlight and discuss both lexical and grammatical transformations in the translation of scientific discourse.

The object of this study is the lexical and grammatical features found in English scientific articles

The subject is the translation transformations employed when translating these articles into Ukrainian.

The material for the research will be sourced from scientific articles available on platforms such as Sciencedaily and Scientificamerican.

The theoretical significance of this work lies in providing a linguistic description of the lexical-grammatical features of English scientific texts and their translation into Ukrainian. This contributes to a deeper understanding of the challenges and strategies involved in the translation process.

The practical significance of the study is evident in its applicability to students preparing for classes in the theory and practice of translation. The obtained results can be utilized in various academic contexts, including seminar and practical sessions, as well as in the preparation of essays, course and diploma theses. Additionally, the findings may be valuable for students conducting scientific research on the translation of scientific information, and during different forms of translation practice.

Research paper structure. The work consists of an introduction, two chapters, conclusions, a list of used sources and two appendices.

CHAPTER 1

THEORETICAL FOUNDATIONS OF LINGUISTIC AND TRANSLATION STUDIES

1.1. Overview of general linguistic theories related to the translation

An overview of linguistic theories relevant to translation encompasses several influential frameworks that delve into the structure, function, and communication of language within the field of translation studies. These theories offer valuable perspectives for understanding the intricacies of language and guiding the process of translation. Here's an exploration of key linguistic theories in this context:

1. Structural linguistics

Structural linguistics, pioneered by Ferdinand de Saussure, stands as a foundational theory that revolutionized the understanding of language as a dynamic and interconnected system. Saussure's work emphasized the synchronic analysis of language, focusing on its internal structure and relationships rather than historical evolution (Chipere, 2003, p.134).

In the realm of translation, Structural Linguistics introduces a framework that encourages translators to delve into the intricate web of linguistic elements. The theory posits that languages are systems of signs, where meaning is derived from the relationships between these signs rather than intrinsic properties of the signs themselves (Білоус, 2013, p.13).

Translators influenced by Structural Linguistics adopt an approach that goes beyond word-for-word substitution. Instead, they consider the broader structural aspects of language, identifying corresponding elements and relationships in both the source and target languages. This involves understanding the syntactic, semantic, and pragmatic structures at play and ensuring their equivalence in the translation (Вакуленко, 2009, p.16).

2. Functional linguistics

Functional linguistics, influenced significantly by the work of Michael Halliday, represents a paradigm shift in linguistic theory by placing paramount importance on the communicative functions of language. Unlike structural linguistics, which focuses on the internal structures of language, functional linguistics seeks to uncover how language operates in real communicative contexts (Tompkins, 2001, p.55).

Halliday's framework, known as Systemic Functional Linguistics (SFL), considers language as a social semiotic system, emphasizing its role in expressing meanings and accomplishing communicative functions within various contexts. This perspective aligns with the belief that language is a tool for communication, and its structure is intricately tied to its function in conveying meaning.

In the context of translation, Functional Linguistics guides translators to go beyond the mere reproduction of linguistic forms and delve into the underlying communicative intent of the source text. Translators employing this theory are tasked with discerning the functions that language serves in the source text and replicating those functions in the target language, ensuring that the translated text conveys the same communicative purposes (Корбут, 2014, p.36).

3. Cognitive linguistics

Cognitive linguistics, rooted in the realm of cognitive science, offers a distinctive perspective on language by delving into the intricacies of mental processes involved in both understanding and producing language. This theory challenges traditional linguistic models that primarily focus on formal structures and instead places emphasis on the cognitive mechanisms that underlie language use. At the core of Cognitive Linguistics is the recognition that language is deeply intertwined with human cognition. Rather than viewing language as a detached system of rules, cognitive linguists explore how our mental faculties shape and are shaped by linguistic expressions. This approach draws attention to the dynamic interplay between language, thought, and perception (Білоус, 2013, p.34).

One fundamental concept within Cognitive Linguistics is that of conceptual metaphors. According to this idea, abstract or complex concepts are often understood

and expressed through metaphorical mappings onto more concrete, everyday experiences. Translators employing Cognitive Linguistics are attuned to these metaphorical structures in the source language and strive to replicate them in the target language to ensure the preservation of intended meanings.

4. Pragmatics

Pragmatics, as a linguistic theory, delves into the dynamic interplay between language use and its broader context, emphasizing the situational and social factors that influence the interpretation and construction of meaning. Pragmatics goes beyond examining language as a static system of rules and instead explores how communication unfolds in real-world situations (Дядюра, 2017, p.39).

One key aspect of pragmatics is the recognition that the meaning of an utterance extends beyond its literal interpretation. Context, social relationships, and cultural nuances play pivotal roles in shaping the pragmatic meaning of linguistic expressions. In translation, understanding and reproducing these contextual and social influences are paramount to ensuring effective communication (Tompkins, 2001, p.64).

5. Semiotics

Theoretical framework rooted in the works of scholars like Ferdinand de Saussure and Charles Sanders Peirce, serves as a crucial lens for understanding the role of signs and symbols in language and culture. This interdisciplinary field extends beyond linguistic signs to encompass a broader spectrum of cultural symbols and their meanings. In the context of translation, semiotics provides a nuanced approach to analyzing and transferring meaning across different languages and cultures. Translators adopting a semiotic perspective scrutinize not only the surface-level meaning of linguistic signs but also delve into the underlying cultural and symbolic significance attached to these signs (Herasymenko, 2023).

6. Discourse analysis

Beyond sentence-level analysis, discourse analysis studies language in larger communicative units. Translators utilize discourse analysis to grasp cohesion, coherence, and rhetorical strategies for faithful reproduction.

7. Corpus linguistics

Centered around large collections of authentic texts, corpus linguistics aids in understanding language patterns. Translators leverage corpora to enhance accuracy, verify terminology, and capture natural language use (Derik, 2020).

Comprehending these linguistic theories equips translators with a robust toolkit for navigating the complexities of translation. The choice of theory depends on the specific characteristics of the text, ensuring that translations not only maintain linguistic fidelity but also align with contextual and cultural nuances.

1.2. Review of translation studies literature on translation of scientific articles

Scientific texts are characterized by a certain set of vocabulary, characteristic only for this genre. Such vocabulary includes terms, professionalisms, technicalities, etc. These types of vocabulary are transmitted in the target language using various methods, for example, literal translation or using various translation transformations. Transformations are one of the common techniques, and in order to make the most correct decision when performing a translation, it is necessary to have an idea of the most frequent types of them (Білоус, 2013, p.24).

According to Мірам, & ГОН (2003) the *main task of technical translation* is to convey the information communicated to the reader as clearly and accurately as possible. This is achieved by a logically based presentation of factual material, without explicitly expressed emotionality. The style of technical literature can be defined as formal and logical. It should be noted that the intensive development of the technical style led to the formation of numerous genres within it, such as textbook, patent description (invention description), abstract, abstract, documentation, catalog, reference book, specification, instruction, etc. (House, 2016, p.22).

Each genre has its own individual stylistic features, but they do not violate the unity of the technical style, imitating its general features and features. Mastery of technical translation, like any other type of translation, includes an excellent sense of

the native language, a fairly deep knowledge of a foreign language (grammar, vocabulary, idiomatics), familiarity with the theory of translation and the ability to use translation techniques, as well as the possession of background technical knowledge (Derik, 2020).

In addition, Baklazhenko & Hnatiuk (2022) states the translator must have an idea of the linguistic features of the genre to which the translated text belongs, and cope with translation tasks of a non-linguistic nature. But in practice it is impossible to achieve this, therefore, for the successful execution of a technical translation, it is necessary to use dictionaries and glossaries, and especially vocabulary of a wide meaning, since any written translation of technical texts, as already mentioned above, is characterized by a large content of specialized terms and terminological phrases, as well as the presence of lexical constructions and abbreviations.

Among the *linguistic characteristics* that distinguish scientific and technical texts from other types of text, and also play an important role in translation, most scientists single out the following:

- 1) complexity of syntactic constructions;
- 2) lexical, syntactic and compositional stereotyping;
- 3) the regulated nature of the use of emotional capabilities;
- 4) saturation with syntactic and lexical stamps;
- 5) the predominance of objectivity in the presentation, the combination of a subjectless way of presentation with the expression of the author's subjective opinion;
- 6) extensive use of symbols, formulas, tables, etc. (Gile, 2009).

Significant saturation of the informative field with specific terminology is another and perhaps the most important feature of a linguistic nature inherent in a scientific and technical text. Terms are words or phrases that define a clearly and unambiguously defined concept and its relationship with other concepts within a special field (House, 2016).

The basis of language design of scientific and technical texts is standardization. The syntactic features include the syntactic completeness of the statement, the presence of analytical constructions, the frequent use of clichéd structures, mainly the

nominal nature of the morphological components of the sentence, an extensive system of connecting elements (conjunctions, connecting words, etc.), etc. (Білоус, 2013, p.28).

The complexity of syntactic constructions in scientific and technical texts is associated with multi-level sequential subordination with a large number of means of communication between sentences. These connections have a linear character, which corresponds to the sequence of a scientific presentation, when each subsequent sentence develops the previous one. the type of dominant information can be decisive among the typological features of the text relevant for translation. From the point of view of Gile (2009), content-factual information, as a verbalized message about facts, certain events, processes, phenomena that are occurring or will occur, is widely presented in scientific and technical texts.

Factuality optimizes the information balance, as it is more easily perceived and understood by the reader and does not require him to use significant arrays of auxiliary information for decoding, such as:

1. Lexical (abbreviations, general language and special terminological), graphic means (brackets, colons) and syntactic means (adverbial inflections, which are compressive synonyms for subordinate meaningful sentences). Any text of this type differs from others by a powerful arsenal of auxiliary sign systems (from conditional designations x , y , z and formulas to diagrams and drawings), which is also the most compressive means of verbal actualization of information.

2. Terms, the totality of which in a scientific text is a self-regulating lexical apparatus specializing in the transmission of factual information. the terms are unambiguous, devoid of emotion and independent of context.

3. Neutral lexical background of the rest of vocabulary – vocabulary of general scientific description. it represents the written literary norm of the language and has developed synonymy, and synonyms, as a rule, are stylistically equal.

4. Linguistic means that ensure the objectivity of presenting factual information: various means of expressing passivity in relation to the formal subject, impersonal semantics of the subject.

5. Predominance of the present tense of the verb, the use of which makes it possible to present information as absolutely objective, as it is outside of time (atemporal nature of the text).

6. Linguistic means that emphasize the high level of abstractness of the presentation:

- a significant number of complex words built according to word-formation models with an abstract meaning;
- clear nominativeness of the text (the predominance of nouns; expression of action through a verbal noun with a de-semanticized verb, for example, “affects the object”) (Максимов, 2016, p.1).0

Therefore, it can be concluded that the goal of translation from the point of view of the communicative-functional approach, determined by the initiator for scientific and technical translation, is the reproduction of the translated text, the informational content of which fully meets the requirements of the initiator of the translation, while it is assumed that this content is the same in the original and translated texts (Derik, 2020).

On the basis of a comparative analysis within the scope of translations of scientific and technical texts, there is a strategy of communicative equivalent translation, the result of which is the reproduction of the communicative analogue of the original text in the language of translation in accordance with the communicative intention of the sender of the original message. It is worth noting that the general approach created by the translator to the implementation of his activity is the result of the correlation of all components of the translation strategy – orientation in the situation, formulation of the goal, forecasting and planning.

1.3. Specifics of scientific discourse

Knowledge about technology and technical means, together with general scientific and special knowledge, belongs to the scientific model of the world (Максимов, 2016, p.25), which is verbalized using language. As you know, language

is the most important component of any human activity, including scientific and technical activity.

Science as a form of thinking is associated with special characteristics in the presentation of facts, phenomena and events, which form a special functional variety of the general literary language – the scientific style. The scientific style is characterized by high information content, logic, consistency of presentation, clarity of formulation and clarity of presentation of thoughts. All these features, according to the observations of numerous researchers, find their expression in strict normalization, standardization, accuracy, clarity and conciseness in the expression of thoughts, terminology of speech, widespread use of abstract vocabulary, the use of words in their objective, concrete meaning, impersonality, consistency, completeness, completeness of statements, etc., characteristic of scientific texts (Leonardi, 2000, p.7).

Industrial and technical communication differs from scientific and theoretical communication in its linguistic means. These differences can be traced both at the level of types of terminological vocabulary and at the level of the grammatical structure of the text. In production and technical texts, terms of the denotative type, general technical terms and compound special terms formed on the basis of general technical ones predominate. There are a large number of nomenclature units and professionalisms represented here.

At the grammatical level, the most striking indicator that distinguishes texts of a production-technical and scientific-theoretical orientation was, according to the scientist, the percentage of concrete and abstract nouns. Today technology is an integral part of human life. It becomes an indicator of the social relations within which his labor activity is carried out. New concepts, phenomena and objects receive their names and are used or rejected by the linguistic community in the process of communication (Karamysheva, 2008, p.23).

The appearance of new names, special architectonics, logic and conciseness of presentation of scientific facts are the main indicators of this layer of general literary language. The most important indicator of the language of technology are terms, most

of which indicate the names of artifacts. An *artifact* (from the Latin *artefactum* – artificially made) is understood as an object manufactured, made by a person (Merriam-Webster). The names of artifacts are included in the language of technology not directly, but as an integral part of terminologies or terminological systems. The question of the relationship between the last two concepts is debatable in modern terminology and requires separate consideration.

The terminology of a specific scientific field can be understood not just as a set of terms, but as a system of terms, i.e., a terminology system that reflects the system of concepts of a given field of knowledge. Thus, in accordance with this interpretation, the terms ‘terminology’ and ‘terminosystem’ become synonymous.

However, there is another point of view. Leonardi (2000), for example, notes the fundamental differences between the concepts of ‘*terminology*’ and ‘*terminosystem*’:

- the first develops together with the corresponding area and the corresponding system of concepts gradually and does not appear as a complete system;
- the author argues that we can talk about a system of terms only when a system of concepts in the corresponding industry has been formed.

In technical texts, in contrast to scientific and theoretical ones, the dominant role is played by vocabulary of a different quality than general scientific, namely general technical. General technical vocabulary includes words that signal the scientific, technical and industrial nature of the text. What makes them similar to general scientific words is the universal nature of their use as they serve many technical specialties. In contrast to general scientific vocabulary, a significant amount of general technical vocabulary consists of words that are correlated with technical objects (apparatus, device, machine, mechanism, etc.) used in various areas of modern industry – metallurgical, construction, chemical, mining, etc., the structure of these objects, composition and properties (Karamysheva, 2008, p.35).

According to the degree of abstraction/concreteness of the designated concept, general technical terms can be divided into terms of denotative-significative and denotative types. This division is based on the distinction between scientific-

theoretical and production-technical terms. Correlation with a certain type of concept determines the most essential substantive features that reveal semantic features, according to which all terms can be divided into denotative and significative (Leonardi, 2000).

Such features, according to scientists, primarily include the semantic feature concreteness. This meaningful feature is predetermined linguistically: by the conceptual or subject correlation of terms. In the dictionary of any language, based on the internal semantic connections of the dictionary, words are naturally combined into two groups of different nature:

- 1) denotative vocabulary, gravitating towards designations of objects of the external world, denotations, and
- 2) significative vocabulary, gravitating towards designations of concepts – significats (Gile, 2009).

House (2016) also speaks about the division of terminological names into terms-concepts and terms-names, differing in significative and denotative meaning. The denotation for production and technical terms is realities: first of all, *objects* (tools, equipment, materials, premises, etc.) and, to a lesser extent, *processes* (technological operations and actions that form the basis of the production cycle). Hence the predominance of denotative, concrete conceptual terms in the nominative system of production and technical texts. The idea of reality, designated by a denotative term, can be conveyed through a drawing, photograph, diagram (Karamysheva, 2008).

Production and technical realities are first of all described, since the dictionary definition of the term does not give a comprehensive idea of it, but only helps to distinguish it from other production and technical realities. Terms of the significative type include terms denoting scientific and theoretical concepts. The lexical meaning of such terms is based on a significat – an idea of a scientific-theoretical concept, therefore their meaningful feature is the sign of ‘abstractness’. Scientific-theoretical terms, as a rule, denote categorical concepts that require mandatory disclosure by scientists, interpretation using a scientific definition (Hadeel, 2020, p.550).

Among general technical terms, in addition to denotative terms (such as screw, conveyor, manipulator, excavator, dump truck, etc.), there is a significant group of words that, in their semantics, occupy an intermediate position between denotative and significative terms and, due to this, can be classified as terms of the denotative-significative type (Herasymenko, 2023).

The semantics of such lexemes combine denotative (objective) and significative (conceptual) meanings, which is not the case with purely denotative units of terminological vocabulary – general technical terms-names of specific technical realities and objects. Unlike general technical terms of the denotative type, the meaning of a general technical term of the denotative-significative type cannot be conveyed by a drawing or diagram (Baklazhenko & Hnatiuk, 2022).

The peculiarities of semantic transfer and preservation of message content during the translation of scientific articles from English to Ukrainian highlight the intricate challenges and nuances inherent in the translation process. This study delves into the complexities associated with conveying the precise meaning and scientific terminology across languages, emphasizing the need for a nuanced understanding of both source and target languages. It underscores the importance of maintaining accuracy, coherence, and clarity to ensure that the original message is faithfully preserved. The research sheds light on the impact of linguistic and cultural differences on the translation of scientific content, emphasizing the role of skilled translators in bridging these gaps (Karamysheva, 2008).

In conclusion, navigating the intricacies of semantic transfer in scientific translation demands a comprehensive approach that considers linguistic, terminological, and contextual factors to achieve optimal communication and comprehension between English and Ukrainian readerships.

CHAPTER 2

SCIENTIFIC DISCOURSE: DISCOURSE FEATURES, TRANSLATION OPTIONS

2.1. Lexical transformations in the translation of scientific discourse

Using *direct equivalents* in scientific translation is a common and frequent practice. It involves translating scientific terms and concepts directly from the source language to the target language when there are established and recognized equivalents. This approach ensures precision, consistency, and clarity in conveying scientific information. It is a widely adopted method to maintain technical accuracy, facilitate cross-language communication, and uphold standards within scientific communities.

The material for the research will be sourced from scientific articles available on platforms such as *Sciencedaily* and *Scientificamerican*.

*Qubits composed of **holes** could be the trick to build faster, larger quantum computers.* – Кубіти, які складаються з **отворів**, можуть стати ключовим рішенням для побудови швидших та більших квантових комп'ютерів. (“*Smart Catheters*” for the Major Problem of Catheter-Related Infections, n.d.).

In this context, Ukr. ‘отвори’ (holes) is translated as a direct equivalent, maintaining the straightforward representation of the original term in the target language. This approach ensures that the intended meaning is accurately communicated without introducing unnecessary complexity or ambiguity. In this case, it allows for a clear understanding that ‘holes’ refer to specific components of qubits in the context of quantum computing.

*The new smart **catheter** senses the start of an infection, and only then releases its antibiotic substance, which is nitric oxide.* – Новий розумний **катетер** відчуває початок інфекції і лише потім вивільняє антибіотичну речовину, яка є оксидом азоту (“*Smart Catheters*” for the Major Problem of Catheter-Related Infections, n.d.).

Here, Ukr. ‘*катетер*’ is a direct equivalent, providing a straightforward translation that accurately conveys the medical device referred to in the source text. The use of a direct equivalent ensures clarity and precision in describing the technology mentioned in the original sentence.

*Collectively these projects have gathered images and **spectra** -stars' light spread out into its individual wavelengths – for millions of stars. – Колективно ці проекти зібрали зображення і **спектри** (світло зір, розкладене на окремі довжини хвиль) для мільйонів зір (Finkbeiner, 2024).* In this instance, transliteration was not used because the term ‘*spectra*’ is a scientific term that can be directly translated to convey its meaning accurately in the target language. The term Ukr. ‘*спектри*’ was translated as Engl. “*spectra*” to maintain precision and clarity in describing the dispersion of stars’ light into individual wavelengths.

*In this way, a **quantum bit** can be made robust against charge **fluctuations** stemming from the solid background. – Таким чином, **квантовий біт** може бути стійким до **флуктуацій** заряду, що виникають через твердий фон (Qubits Composed of Holes Could Be the Trick to Build Faster, Larger Quantum Computers, n.d.).*

In this case, the term Engl. “*quantum bit*” was translated as Ukr. “*квантовий біт*”. The use of transliteration was not necessary, since the term “*quantum bit*” is already known and used in the Ukrainian language in the same form. Direct translation in this case ensures the accuracy of the transmission of the scientific concept and preserves the technical specificity of the term.

*To evaluate if their **synthetic neurons** can solve real-world problems, the researchers first wired 24 such nanoscale devices together in a network inspired by the connections between the brain's cortex and thalamus, a well-known neural pathway involved in pattern recognition. – Щоб оцінити, чи можуть їхні **синтетичні нейрони** вирішувати проблеми реального світу, дослідники спочатку об’єднали 24 таких нанорозмірних пристрої в мережу, натхненну зв’язками між корою головного мозку та таламусом, добре відомим нейронним*

шляхом, залученим до розпізнавання образів (*New Brain Cell-like Nanodevices Work Together to Identify Mutations in Viruses, n.d.*).

Here, the term Ukr. ‘синтетичні нейрони’ (Engl. *synthetic neurons*) is a direct translation, and ‘нанорозмірні пристрої’ (Engl. *nanoscale devices*) is also translated directly. The choice of direct equivalents in these instances helps maintain technical accuracy and ensures that the scientific concepts are conveyed accurately in the target language.

*With the **radar**, scientists can see down to the base of the sediments to reveal the top surface of the buried crater floor. – За допомогою **радар** вчені можуть побачити основу відкладень, щоб виявити верхню поверхню дна похованого кратера (Confirmation of Ancient Lake on Mars Builds Excitement for Perseverance Rover’s Samples, n.d.-b).*

The term Engl. “radar” was translated using a direct equivalent in the target language to maintain clarity and accuracy in conveying the technological concept

*Participants were then randomly assigned to have either a **surgical bypass** or endovascular procedure. – Потім учасники були випадковим чином розподілені на **хірургічне шунтування** або ендovasкулярну процедуру (Bypass Surgery Favorable for Initial Treatment of Chronic Limb-Threatening Ischemia, n.d.).*

In this translation, the term ‘*surgical bypass*’ is used as an equivalent for the original term in the source text. The connotation and specificity of the term are retained in the target language. The phrase Engl. ‘*surgical bypass*’ refers to a medical procedure where a surgical detour is created to redirect blood flow around a blocked or narrowed vessel. This technique is mirrored in the Ukrainian translation as Ukr. ‘хірургічне шунтування’ conveying the idea of a surgical intervention involving the creation of a bypass. The term Engl. ‘*endovascular procedure*’ is also translated as ‘ендоваскулярна процедура’ to maintain consistency and accuracy in conveying the medical procedures mentioned in the source text.

*The properties of **formation water**, which are related to well completion engineering, include mainly the pH value and total salinity. a. pH value. – Властивості **пластової води**, які пов'язані з технікою завершення свердловин,*

включають в основному значення рН і загальну мінералізацію. а. значення рН (Ran et al., 2014, p. 273).

In this translation, the term Engl. ‘well completion engineering’ is rendered in Ukrainian as Ukr. “техніка завершення свердловин”. The use of ‘техніка’ (Engl. *technique*) and Ukr. ‘завершення свердловин’ (Engl. *well completion*) serves as an equivalent that maintains the technical specificity of the original term in the source text. The specific term Engl. ‘pH value’ is translated accurately as Ukr. ‘значення рН’ in Ukrainian, ensuring that the scientific concept of pH is preserved in the target language. The overall translation demonstrates the application of equivalent terms to convey the technical aspects of well completion engineering and the specific property of formation water (pH value) in a clear and accurate manner.

Reservoir parameters constitute the basis for quantitative evaluation of the accumulation-permeation capacity and gas-bearing characteristics in volcanic gas reservoirs. – Параметри колектора є основою для кількісної оцінки акумуляційно-проникної здатності та газоносних характеристик у вулканічних газових колекторах (Ran et al., 2014, p. 273).

In this translation, the term Engl. “Reservoir” is accurately rendered in Ukrainian as Ukr. ‘колектор’. The use of ‘колектор’ ensures an equivalent representation that maintains the specific meaning related to geological and hydrocarbon reservoirs in the source text. The overall translation indicates the application of the equivalent term to convey the concept of a geological reservoir in the context of volcanic gas reservoirs. The term Ukr. ‘колектор’ is commonly used in the Ukrainian language in the geological and engineering contexts to refer to reservoirs that hold and release hydrocarbons or other fluids.

The latest star maps are rewriting the story of our Milky Way, revealing a much more tumultuous history than astronomers suspected. – Останні зоряні карти переписують історію нашого Чумацького Шляху, відкриваючи набагато бурхливішу історію, ніж підозрювали астрономи (Finkbeiner, 2024).

In this translation, the term “Milky Way” is an accurate equivalent for ‘Чумацький Шлях’ in Ukrainian. “Чумацький Шлях” is a common term used in

Ukrainian to refer to the Milky Way galaxy. The phrase may be translated literally as Engl. ‘*Chumak’s Path*’ in English, and it represents the traditional Ukrainian name for our galaxy. The use of this equivalent maintains the cultural and linguistic context while conveying the astronomical concept of the Milky Way.

*He carries in his mind a picture of what astronomers have been able to put together so far: a dense, barred center embedded in a layered disk of gas and stars, some of which pile up into **arms** that spiral through the disk. – У його уяві утримується зображення того, що астрономи досі змогли утворити: щільний, перегороджений центр, вбудований у шаруватий диск із газу та зірок, деякі з яких збираються у **рукави**, які спірально обертаються крізь диск (Finkbeiner, 2024).*

In this context, the term Ukr. ‘*рукави*’ (arms) is an appropriate equivalent for Engl. ‘*arms*’ in English. It is commonly used in astronomy to describe the spiral arms of a galaxy. The phrase ‘some of which pile up into arms that spiral through the disk’ refers to the arms formed by the accumulation of gas and stars in a spiral pattern within the disk of a galaxy. The use of ‘*arms*’ in the English translation accurately conveys the astronomical concept of spiral arms within a galaxy’s structure.

One of the common ways of translating terminology is *transcription and transliteration*, which is the reproduction of the form of a foreign lexical unit by means of the translation language. It is advisable to combine both methods, since in modern translation practice it is customary to transcribe a foreign lexeme, while preserving some elements of transliteration. Based on the results of the research, it can be stated that transliteration and transcription are most often used to translate eponymous terms (terms that have their own names in the composition), etc.

This method of translating English terms into Ukrainian cannot be overestimated. The number of Latinisms of the modern terminology of the English language, which are transmitted in Ukrainian by quasi-untranslatable methods, is very large.

*As of 1993, ESA’s previous star-mapping satellite, **Hipparcos**, had mapped 2.5 million stars; by 2023 **Gaia** had mapped around 1.8 billion of them. – На 1993 рік*

попередній зірковий космічний апарат ЄКА, *Хіппаркос*, відобразив 2,5 мільйона зір, а до 2023 року *Гайя* відобразила приблизно 1,8 мільярда зірок (Finkbeiner, 2024).

Ana Bonaca recently got her first faculty job, as a staff scientist at the *Carnegie Observatories in Pasadena*, but she's been interested in our galaxy since she was in middle school. – Нещодавно *Ана Бонака* отримала свою першу посаду наукового співробітника в *Обсерваторіях Карнегі в Пасадені*, але вона цікавиться нашою галактикою з середньої школи (Finkbeiner, 2024).

The surname Engl. 'Bonaca' and the name Engl. 'Ana' in the original were not changed and remained unchanged in the English text. This approach preserves the original names and surnames to ensure translation accuracy and consistency.

The next lexical transformation is transliteration, which is the process of converting text or characters from one writing system into another. It involves representing the sounds of words or names in one script using the corresponding characters of another script. The goal of transliteration is to accurately convey the pronunciation of words across different languages or writing systems, maintaining a consistent and phonetically accurate representation. It is commonly used when dealing with names, technical terms, or other specific words that may need to be presented in a different script without a full translation.

*Reaching these points will facilitate experimental efforts to preserve **quantum information** for as long as possible.* – Досягнення цих точок полегшить експериментальні зусилля зі збереження **квантової інформації** якомога довше (*Bypass Surgery Favorable for Initial Treatment of Chronic Limb-Threatening Ischemia, n.d.-a*).

In this case, transliteration was used for the phrase «quantum information» since it is a technical term that can be standardized and defined in many languages. Preserving the original term helps to avoid potential misunderstandings and ensures accuracy and clarity in the context of quantum information. This approach allows for maintaining the technical specificity and scientific meaning of the term in translation, facilitating understanding for experts in the field.

*Mice pass the mirror test, a classic **indicator** of self-recognition. – Миші проходять тест з використанням дзеркала, класичного **індикатора** самовизнання (Mice Pass the Mirror Test, a Classic Indicator of Self-Recognition, n.d.).*

Transliteration was used for the word Engl. “*indicator*” in the sentence because it refers to a specific concept or test that is commonly known and understood in its original form. Preserving the original term helps maintain clarity and precision in conveying the intended meaning of the test. In this context, «*indicator*» is a technical term that denotes the purpose or function of the mirror test as a method for assessing self-recognition in animals. Transliteration allows for consistency and accuracy in conveying the scientific concept across languages.

*They'd seen other **galaxies** merging with one another and looking unkempt, but they didn't know whether an earlier Milky Way might have done the same. – Вони бачили, як інші **галактики** зливаються одна з одною і виглядають недоглянутими, але вони не знали, чи раніше Чумацький Шлях міг зробити те саме (Finkbeiner, 2024).*

In this case, transliteration was not used because the term Engl. “*galaxies*” is not a specific name or technical term that requires preservation in its original form. Instead, the word Ukr. ‘*галактики*’ was translated into English as Engl. “*galaxies*” since it represents a general concept without a need for maintaining the exact phonetic or written representation.

*Ancient DNA recovered from Brazilian remains shows that **syphilis** and other **treponemal diseases** originated some 10,000 years earlier than previously thought. – Давня ДНК, отримана з бразильських останків, показує, що **сифіліс** та інші **трепонемні захворювання** виникли приблизно на 10 000 років раніше, ніж вважалося раніше (Callaway & magazine, 2024).*

Transliteration was used in this case because the terms Engl. “*Syphilis*” and ‘*treponemal diseases*’ are specific medical terms that do not require transliteration. Instead, these terms were translated directly into Ukrainian as ‘*сифіліс*’ (Engl.

syphilis) and Ukr. ‘трепонемні захворювання’ (Engl. *treponemal diseases*) to accurately convey the medical meaning in the target language.

*The most notorious treponemal infection is **venereal syphilis**, which is generally caused by the subspecies *T. pallidum pallidum* but can be caused by other ones as well. – Найвідомішою трепонемною інфекцією є **венеричний сифіліс**, який зазвичай викликається підвидом *T. pallidum pallidum*, але може бути спричинений і іншими* (Callaway & magazine, 2024).

In this case, transliteration was used for the term Eng. ‘*venereal syphilis*’ because it is a technical term with a specific medical context. Transliteration helps to maintain the original form of the term for accuracy and consistency, especially in medical and scientific contexts. The term Engl. ‘*venereal syphilis*’ was transliterated as Ukr. “*венеричний сифіліс*” to preserve the technical specificity of the term in English.

Another method of translation is *loan translation*, which is a morphemic reproduction of the composition of a foreign term by the means of the translation language, as well as verbatim translation of terminological phrases.

*However, they provide preliminary evidence that relatively small, **simple diet adjustments** can directly improve depression symptoms, and that these effects can last up to three months. – Однак вони надають попередні докази того, що відносно невеликі, прості **корекції дієти** можуть безпосередньо покращити симптоми депресії, і що ці ефекти можуть тривати до трьох місяців* (*Randomized Controlled Trial Suggests Healthier Diet May Directly Reduce Depression, n.d.*).

Here, ‘прості корекції дієти’ (simple diet adjustments) is a calque, where the structure of the original term is maintained, but individual words are translated. This choice was made to preserve the simplicity and straightforwardness of the dietary modifications being referred to in the source text.

*The other strategy was an **endovascular procedure** – one performed inside the blood vessels where a balloon is dilated and/or a stent is placed in the blocked segment of the artery to improve blood flow. – Інша стратегія полягала в*

ендоваскулярній процедурі – виконанні всередині кровоносних судин, де балон розширюється та/або стент розміщується в заблокованому сегменті артерії для покращення кровотоку (*Bypass Surgery Favorable for Initial Treatment of Chronic Limb-Threatening Ischemia, n.d.-c*).

Here, Ukr. ‘ендоваскулярна процедура’ (Engl. *endovascular procedure*) is a calque, where the structure of the original term is maintained, but individual words are translated. This choice was made to retain the technical specificity and accuracy of the medical procedure being referred to in the source text.

*The simulations revealed that flow slippage can be caused by tiny **microbubbles** that form on the pipe wall.* – Моделювання показало, що ковзання потоку може бути спричинене крихітними **мікробульбашками**, які утворюються на стінці труби (*Bubbles Go with the Flow, n.d.*).

The term Engl. ‘*microbubbles*’ was translated using a calque in the target language to accurately convey the concept of tiny bubbles on a minuscule scale. In the context of the sentence, which discusses simulations revealing flow slippage caused by these small bubbles forming on the pipe wall, it was essential to maintain the specificity of the term. Therefore, Ukr. “мікробульбашки” (Engl. *microbubbles*) was chosen as a calque to reflect both the size and nature of these bubbles.

*‘The no-slip boundary condition of **liquid flow** is one of the most fundamental assumptions in fluid dynamics,’ explains first author Yuji Kurotani.* – ‘Гранична умова відсутності ковзання **потоку рідини** є одним із найбільш фундаментальних припущень у динаміці рідини’, – пояснює перший автор Юджі Куротані (*Bubbles Go with the Flow, n.d.*).

The term Engl. ‘*liquid flow*’ was translated using a calque in the target language to retain the specific meaning and technical nuances associated with the field of fluid dynamics. In scientific and technical translations, the use of calques is a common strategy when a direct equivalent exists in the target language and accurately reflects the concept in the source text. In the sentence, the importance of the «no-slip boundary condition» in the context of fluid dynamics is being discussed. This

condition refers to the assumption that at the surface of a solid boundary, the fluid immediately adjacent to it comes to rest (experiences no slip).

*Volcanoes acted as a **safety valve** for Earth's long-term climate. – Вулкани діяли як **запобіжний клапан** для довгострокового клімату Землі (Volcanoes Acted as a Safety Valve for Earth's Long-Term Climate, n.d.).*

The term Engl. 'safety valve' was translated using a calque in the target language to convey the metaphorical meaning within the context of Earth's climate regulation. A safety valve, in a literal sense, is a device used to control and release pressure in a system to prevent potential damage. In the metaphorical sense used in the sentence, it refers to the role of volcanoes in regulating Earth's long-term climate.

*The research team also measured the ability of the material to generate electricity using a difference in temperature, or **thermal gradient**, between two environments. – Дослідницький колектив також виміряв здатність матеріалу генерувати електрику за рахунок різниці у температурі, або **теплового градієнту**, між двома середовищами (Flexible Material Shows Potential for Use in Fabrics to Heat, Cool, n.d.).*

The term Engl. 'thermal gradient' was translated using a calque in the target language to ensure that the technical and scientific meaning of the phrase is accurately conveyed. As a "thermal gradient" refers to the variation in temperature across a space, and it is a crucial concept in the study of heat transfer and thermodynamics.

*A film made of tiny **carbon nanotubes** (CNT) may be a key material in developing clothing that can heat or cool the wearer on demand. – Фільм, виготовлений з крихітних **вуглецевих нанотрубок** (CNT), може стати ключовим матеріалом у розробці одягу, який може обігрівати або охолоджувати користувача за його вимогою (Flexible Material Shows Potential for Use in Fabrics to Heat, Cool, n.d.).*

Here, Ukr. 'вуглецеві нанотрубки' (Engl. *carbon nanotubes*) is a calque, where the structure of the original term is preserved, but individual words are translated. This choice was made to accurately convey the scientific and technical

nature of carbon nanotubes, which are cylindrical structures made of carbon atoms and possess unique thermal and electrical properties. In this case, it allows for a clear representation of the advanced material – carbon nanotubes – in the context of developing clothing with specific thermal capabilities.

Flexible material shows potential for use in fabrics to heat, cool – Гнучкий матеріал виявляє потенціал для використання в тканинах для обігріву та охолодження (Flexible Material Shows Potential for Use in Fabrics to Heat, Cool, n.d.).

Here, Ukr. “Гнучкий матеріал” (Engl. *Flexible material*) is a calque, where the structure of the original term is retained, but individual words are translated. This choice was made to accurately convey the nature of the material being flexible, which is crucial in the context of its potential use in fabrics for heating and cooling applications.

A second subspecies is most commonly linked to yaws, which cause skin lesions on the hands and feet. – Другий підвид найчастіше пов’язаний з фрамбезією, яка викликає ураження шкіри на руках і ногах (Callaway & magazine, 2024).

The translation opted for a calque in the target language to uphold the technical precision and specificity of the term Engl. ‘yaws’. In this context, Ukr. “фрамбезія” (Engl. *yaws*) is rendered as a calque, preserving the original term’s structure while translating individual words. This decision aims to faithfully convey the particular disease mentioned in the source text to the target language.

A new study indicates holes the solution to operational speed/coherence trade-off, potential scaling up of qubits to a mini-quantum computer. – Нове дослідження вказує на можливість розв’язання торговельних робочих швидкостей та узгодженості шляхом виявлення переваги, а також потенційної можливості масштабування кубітів до міні-квантового комп’ютера (Qubits Composed of Holes Could Be the Trick to Build Faster, Larger Quantum Computers, n.d.-b).

The term Engl. “operational speed” was translated using a calque in the target language to maintain the technical accuracy and specificity of the concept. Here, Ukr. ‘торговельні робочі швидкості’ (Engl. *operational speed*) is a calque, where the

structure of the original term is maintained, but individual words are translated. This choice was made to accurately convey the technical nuances of the concept referred to in the source text in the target language.

Generalization often helps the translator avoid tautologies, which are characteristic of English-language scientific texts and are unacceptable in texts of the corresponding style in the Ukrainian language

*‘Nanotechnology’s main advantage over conventional medical treatments is its ability to more precisely target tissues, such as cancer cells targeted by chemotherapy’. – Основною перевагою **нанонауки** перед традиційними методами лікування є їхня здатність більш точно спрямовуватися на тканини, такі як ракові клітини, які впливають за допомогою хіміотерапії (New Research May Make Future Design of Nanotechnology Safer with Fewer Side Effects, n.d.).*

In the given translation, the translational technique of generalization is applied to convey the concept of ‘Nanotechnology’. The English equivalent “Nanoscience” or ‘Nanotechnology’ encompasses the broader field that includes various applications, including medical treatments. By using the general term ‘Nanotechnology’ the translation aims to capture the comprehensive nature of the field, emphasizing its ability to precisely target tissues in diverse applications beyond just medical treatments. This approach allows for a broader and more inclusive understanding of nanotechnology, aligning with its multidisciplinary nature.

***Overload training** – or, training to exhaustion followed by a period of rest and recovery before a race – is a method used by many endurance athletes in search of a personal best. – Тренування з перевантаженням – або тренування до виснаження з наступним періодом або відпочинком і відновленням перед гонкою – це метод, який використовують багато спортсменів на витривалість у пошуках особистого рекорду (New Measure for Stress in Overtrained Athletes, n.d.).*

In the translation provided, the translational technique of generalization is applied to convey the concept of Ukr. ‘Тренування з перевантаженням’. The English equivalent Engl. ‘Overload training’ is a comprehensive term that

encapsulates the training method described in the source text, which involves pushing the body to exhaustion, followed by a period of rest and recovery before a race. By using the general term Engl. ‘*Overload training*,’ the translation aims to capture the broader training approach used by endurance athletes without getting into specific details. This allows for a more encompassing understanding of the training method and its application in various contexts, such as seeking personal bests in endurance sports.

As the lake dissipated over time, the sediments in the crater were eroded, forming the geologic features visible on the surface today. – 3 часом, по мірі висихання озера, відклади в кратері піддалися ерозії, утворюючи геологічні особливості, які зараз видно на поверхні (Confirmation of Ancient Lake on Mars Builds Excitement for Perseverance Rover’s Samples, n.d.-c).

In the provided translation, the translational technique of *lexical addition* is applied to convey additional details that are not explicitly present in the source text. The English phrase «forming the geologic features visible on the surface today» is an example of lexical addition. This addition provides a more detailed description of the outcome of the sediments eroding over time, specifying that they resulted in the formation of geologic features visible on the surface at present. The purpose of this lexical addition is to enhance the clarity and completeness of the translation by providing additional information that might be relevant or necessary for the target audience to fully understand the geological changes described in the source text.

Untranslatable calquing is manifested in preserving the unchanged internal form of the word. Calquing implies the existence of bilateral interlingual correspondences between elementary lexical units, which are used as the «building material» to reproduce the internal form of the borrowed or translated term. Regarding scientific terminology, we can consider calquing an integral method of conveying specialized vocabulary. In comparison with quasi-untranslatable methods of transcription and transliteration, this type of transformation is most sought after in translating Latinized terms. As revealed, a significant portion of English scientific

and technical terminology has an interdisciplinary orientation and is highly ambiguous.

In the translation of multi-component terminological phrases (3 or more components), a challenge arises for the translator to establish internal semantic connections. Transformation involving reduction, i.e., the sequential exclusion of one component at a time that has weak structural-semantic relations with other modifiers, can assist in translating multi-component terminological phrases. This process aims to simplify them by reducing them to their original two-word combinations.

The method of modulation in scientific discourse involves the adjustment or variation of expressions to convey nuanced meanings, often used to refine or elaborate on a specific concept. This technique allows for a more intricate exploration of ideas, enabling the speaker or writer to convey shades of meaning or emphasize particular aspects within the discourse. Modulation serves as a valuable tool in scientific communication, facilitating a more comprehensive and precise conveyance of complex information.

*The interaction that enables spins **to talk to** electric fields is called the spin-orbit interaction, and is traced all the way back to Einstein's theory of relativity. – Взаємодія, яка дозволяє спінам **взаємодіяти** з електричними полями, називається спін-орбітальною взаємодією, і вона веде свій початок аж до теорії відносності Ейнштейна (Qubits Composed of Holes Could Be the Trick to Build Faster, Larger Quantum Computers, n.d.-b).*

In this context, the use of the verb “to talk” in the original sentence is translated as ‘to communicate.’ The term Engl. ‘spin-orbit interaction’ is introduced to describe the process by which spins interact with electric fields. The choice of “to talk” is modulated to “to communicate”, emphasizing the exchange of information between spins and electric fields. The translated sentence maintains the scientific precision of the original while adapting the expression to convey the intended meaning in English.

Along with modulation, the technique of concretization is widely used in the translation text. This type of transformation differs from semantic development in

that the translator uses a narrow meaning belonging to a particular word, and does not give a new one, as with modulation, for example:

*One solution is to divide sound into two types of **components**, sines and noise, with a smaller number of whistling sine waves and combined with variable noises, or hisses, to complete the imitation. – Одним з рішень є розділення звуку на два типи **складних комплектуючих**, синусів і шуму, з меншою кількістю свистячих синусоїдальних хвиль і в поєднанні зі змінними шумами або шипінням для завершення імітації (Randomized Controlled Trial Suggests Healthier Diet May Directly Reduce Depression, n.d.-a).*

In this instance, the technique of concretization is used in the translation to specify the nature of the “components”. The term “components” (Ukr. “*комплектуючі*”) is further clarified as “types of components” (Ukr. “*складні комплектуючі*”) to emphasize the distinct categories of sound elements.

*This study is limited in that the no change group received no intervention -- ideally, this group would have received alternative diet instructions, check-ins and **monetary contributions** to parallel the diet change group. – Це дослідження має обмеження у тому, що група «без змін» не отримала жодного втручання – ідеальною ситуацією було б надання альтернативних інструкцій до дієсти, контрольних візитів та **фінансового заохочення** для паралельного порівняння з групою зміни дієсти (Randomized Controlled Trial Suggests Healthier Diet May Directly Reduce Depression, n.d.-a).*

In this translation, the technique of concretization is applied to the term Engl. ‘*monetary contributions*’ which is rendered as Ukr. ‘*фінансове заохочення*’ in Ukrainian. The use of Engl. “*financial encouragement*” (Ukr. “*фінансове заохочення*”) adds specificity and clarity to the nature of the contributions. The translator opts for a more tangible and concrete term, emphasizing that the intended purpose of these contributions is to provide support and incentive in a financial form. This choice helps to elucidate the concept of Engl. “*monetary contributions*” by specifying its practical application, namely, as a means of encouraging or motivating individuals within the context of the study.

*Each group member also received two **subsequent check-ins** via phone call. – Кожен член групи також отримав дві **наступні реєстрації** через телефонний дзвінок (Randomized Controlled Trial Suggests Healthier Diet May Directly Reduce Depression, n.d.-a).*

In this translation, the technique of concretization is used to render Engl. ‘*check-ins*’ more explicitly as ‘*subsequent registrations via phone call*’ in English. By using the term Engl. ‘*registrations*’ the translator provides a more specific and tangible description of the process. This choice helps to clarify that the follow-up interactions involve formal registrations or updates, and they occur through phone calls. The term Engl. “*check-ins*” is concretized to emphasize the structured and systematic nature of these subsequent interactions, offering a clearer understanding of the communication method within the given context.

*They named the **wrong-way batch**, which was *bean-shaped*, Sausage. – Вони назвали **цю групу зірок**, які рухались не за звичайним шляхом, і мали форму боба, ‘Ковбасою’ (Finkbeiner, 2024).*

In this translation, the technique of concretization is applied to elucidate the term Engl. ‘*wrong-way batch*’ (Ukr. “*група зірок*”). . The translator specifies it further by describing the batch as Engl. “*bean-shaped*” (Ukr. “*форма боба*”). This concretization adds a tangible characteristic to the abstract term, offering a more precise and vivid image of the described astronomical phenomenon.

*New brain cell-like **nanodevices** work together to identify mutations in viruses – Нові **наноактюатори**, схожі на клітини головного мозку, співпрацюють для виявлення мутацій вірусів (New Brain Cell-like Nanodevices Work Together to Identify Mutations in Viruses, n.d.-a).*

In this translation, the method of concretization is used to enhance the understanding of the term Engl. ‘*nanodevices*’ (Ukr. *наноактюатори*). The translator specifies and vividly describes these devices as Engl. “*brain cell-like*” (Ukr. *клітини головного мозку*) providing a more tangible and comprehensible image of their nature. This concretization helps the reader form a mental picture of the nanodevices, emphasizing their resemblance to brain cells and indicating their role in

collaborative virus mutation detection. The use of «brain cell-like» not only adds specificity but also contributes to a clearer and more evocative representation of the nanodevices in the target language.

*Hence, by mimicking how the brain solves these types of tasks, Williams said brain-inspired or **neuromorphic systems** could potentially overcome some of the computational hurdles faced by current digital technologies. – Отже, наслідуючи те, як мозок розв'язує ці типи завдань, Вільямс висловив думку, що системи, подібні до мозку людини, або **неуроморфні системи**, можуть потенційно подолати деякі обчислювальні труднощі, з якими стикаються сучасні цифрові технології (New Brain Cell-like Nanodevices Work Together to Identify Mutations in Viruses, n.d.-a).*

In this translation, the concretization technique is used to clarify and specify the nature of the systems mentioned as ‘*neuromorphic systems*’ (Ukr. “*неуроморфні системи*”). The translator adds the descriptor ‘brain-inspired’ to emphasize that these systems are designed to imitate the processes and functions of the human brain. This concretization provides a more vivid and tangible understanding of the concept, allowing the reader to visualize the connection between the systems and the brain. Additionally, the term Engl. ‘*neuromorphic*’ is introduced as an alternative to Engl. ‘*brain-inspired*’, offering a specific technical term explanation to describe systems that mimic the structure and function of the nervous system. This concretization aids in conveying the idea that these systems are modeled after the principles found in the brain, enhancing precision and clarity in the target language.

It is worth noting that some types of transformations are completely absent in the translation text, namely: compensation (elements lost during the translation of the original are transferred in the translation text by some other means, and not necessarily in the same place in the text as in the original). However, we do not dare to assert that these types of translation transformations are uncharacteristic of scientific and technical texts in general; their use may be as limited as in the case of antonymic translation.

So, as a result of the research of 50 sentences – translations from scientific texts, a direct equivalent, transcription, transliteration, loan translation, generalization, concretization, modulation, lexical addition was found.

2.2. Grammatical transformations in the translation of scientific discourse

Grammatical transformations play a pivotal role in the translation of scientific discourse. In the intricate realm of scientific language, ensuring precision and accuracy is paramount. Translators often encounter the challenge of adapting grammatical structures while preserving the integrity of the scientific content. One common grammatical transformation involves adjusting syntactic structures to align with the conventions of the target language. This may include rearranging sentences, modifying word order, or adapting complex syntactical constructions. The goal is to convey the scientific concepts seamlessly, considering the syntactic norms and nuances of the target language.

Another crucial aspect is the transformation of specialized terminology and jargon. Scientific disciplines often have language-specific structures that demand meticulous handling. Translators must navigate through these linguistic intricacies, employing grammatical adaptations to uphold the scientific precision of the content.

Among the grammatical transformations in the translation of scientific discourse, a significant role is played by literal translation. This technique involves preserving the structural composition of sentences and accurately reproducing words from the source language into the target language. Literal translation is used to maintain the precision of terminology and the structural logic of scientific statements. This method allows for the conveyance of precise scientific meaning and is utilized where the faithful interpretation of terms and concepts is crucial. Literal translation helps preserve technical accuracy and avoids inaccuracies that may arise from free or expressive reinterpretation.

A second period of deposition occurred when fluctuations in the lake level allowed the river to deposit a broad delta that once extended far out into the lake, but

has now eroded back closer to the river's mouth. – Другий період відкладення відбувся, коли коливання рівня озера дозволили річці утворити широку дельту, яка колись простягалася далеко в озеро, але тепер розмилася ближче до гирла річки (Confirmation of Ancient Lake on Mars Builds Excitement for Perseverance Rover's Samples, n.d.-b).

If life ever existed on Mars, the Perseverance rover's verification of lake sediments at the base of the Jezero crater reinforces the hope that traces might be found in the crater. – Якщо життя коли-небудь існувало на Марсі, перевірка марсоходом Perseverance озерних відкладень біля основи кратера Jezero зміцнює надію на те, що сліди можуть бути знайдені в кратері (Confirmation of Ancient Lake on Mars Builds Excitement for Perseverance Rover's Samples, n.d.-b).

'The rover, which is about the size of a car and carries seven scientific instruments, has been exploring the 30-mile-wide crater, studying its geology and atmosphere and collecting samples since 2021.' – Марсохід, який є розміром приблизно з автомобіль, і несе сім наукових інструментів, досліджує кратер шириною 30 миль, вивчає його геологію та атмосферу та збирає зразки з 2021 року (Confirmation of Ancient Lake on Mars Builds Excitement for Perseverance Rover's Samples, n.d.-b).

This technique is particularly relevant when a scientific text contains rigidly defined terms, formulas, or specific structures that require faithful transfer. Literal translation aids in ensuring stability and accuracy in the linguistic reproduction of scientific content in the new language.

Among them, *transposition* are especially popular (changing the arrangement of language elements in the translation text compared to the original text):

*Says Kurotani, 'The results of our project can help design new pipes that transport viscous fluids, like fuel and lubricants, with much smaller **energy losses**'. – Куротані каже: 'Результати нашого проекту можуть допомогти розробити нові труби, які транспортують в'язкі рідини, наприклад паливо та мастила, з набагато меншими **втратами енергії** (Bubbles Go with the Flow, n.d.-a).*

The translator's use of the transposition technique is explained by the grammatical features of the English language. If in Ukrainian sentence, when rearranging its members, the grammatical connection between words is usually not broken, since it is expressed in the form of the words themselves, in an English sentence, the location of the word determines which member of the sentence it is, and changing the order of words in a sentence leads to a change in its meaning.

Quite often, grammatical replacement transformation is used, it can often be found both at the level of word form and at the level of entire sentences:

*Kumar added that another arduous task for digital machines is pattern recognition, such as identifying a face as the same regardless of **viewpoint** or recognizing a familiar voice **buried within a din of sounds**. – Кумар додав, що це одним важким завданням для цифрових машин є розпізнавання патернів, таких як ідентифікація одного й того ж самого обличчя незалежно від **точки зйомки** або розпізнавання знайомого голосу **серед шумів** (New Brain Cell-like Nanodevices Work Together to Identify Mutations in Viruses, n.d.-b).*

The application of the translational technique of grammatical substitution is evident in the translation of Engl. 'buried within a din of sounds' in the following context: Ukr. 'розпізнавання знайомого голосу серед шумів.' This translation technique is used to accurately represent the grammatical structure and meaning of the source text while adapting it to the linguistic nuances of the target language. It ensures that the translated sentence maintains the intended sense of a familiar voice being identified amid a cacophony of sounds.

It's 'the single largest increase in astronomical knowledge in, like, forever,' says Charlie Conroy of Harvard University. 'It's been shocking.' – *Це 'найбільше збільшення астрономічних знань за весь час', зазначив Чарлі Конрой з Гарвардського університету. 'Це було шокує'* (Finkbeiner, 2024).

In the provided translation, the translational technique of grammatical substitution involving a change in tense is applied. Here, the English present perfect tense «says» is translated into Ukrainian as 'зазначив' (notably, in past tense). This change in tense does not alter the essential meaning but adapts the expression to the

grammatical structure commonly used in Ukrainian to convey the same idea. This grammatical substitution ensures that the translation is grammatically accurate and idiomatic in Ukrainian while preserving the intended meaning of reporting a statement made by Charlie Conroy in the past (Dempsey, 2009a).

The use of this transformation can be explained by the discrepancy between the grammatical forms of English and Ukrainian, or the complete absence in the target language of a suitable word belonging to the same part of speech as the word in the original language.

Grammatical transformations, including *sentence structure* and articulation, play a crucial role in the translation process, ensuring that the translated text is not only linguistically accurate but also contextually appropriate in the target language. One of the fundamental aspects of grammatical translation is sentence parsing or sentence articulation, for example:

The more generations of stars that have lived and died in a galaxy's gas, the more metal-rich are the new stars born inside it; the more metal-rich, the younger the star. – Чим більше поколінь зірок жили і померли в газі галактики, тим більше новонароджених зірок у ній мають високий вміст металів. Чим більше металів, тим молодша зірка (Finkbeiner, 2024).

In 2017 Bonaca and her team found a batch of Milky Way stars in the wrong place: they were in the old, metal-poor halo and had the orbits of old halo stars, but they had the metal-rich chemistry of younger stars from the Milky Way's disk. – У 2017 році Бонака та її команда знайшли групу зірок Чумацького Шляху не в тому місці. Вони перебували в старому гало з бідним вмістом металів і мали орбіти старих зірок гало, але мали хімічний склад, багатий металами, як молодші зірки з диску Чумацького Шляху (Finkbeiner, 2024)..

So, as a result of the research of 50 sentences – translations from scientific texts, there were detected cases of literal translation, cases of permutation, cases of grammatical changes, cases of a sentence structure.

2.3. Lexical and grammatical transformations in the translation of scientific discourse

The usage of *lexical and grammatical transformations* is infrequent in the translation of scientific discourse. Scientific texts often demand precision, accuracy, and fidelity to convey complex ideas and technical details. As a result, translators typically strive to maintain the original structure and terminology as closely as possible, minimizing extensive lexical or grammatical alterations.

Descriptive translation refers to an approach in translation studies that focuses on describing and analyzing translation phenomena without advocating for specific norms or guidelines.

By including the possibility of shear-induced bubble formation, they find that, contrary to the assumptions of many previous works, fluids can experience significant slippage when in contact with fixed boundaries. – Враховуючи можливість утворення бульбашок під впливом зсуву, вони приходять до висновку, що, навпаки до припущень багатьох попередніх робіт, рідини можуть демонструвати значне злипання при контакті з нерухомими межами. (Bubbles go with the flow. (n.d.-a).

In the translation of ‘shear-induced bubble formation’ in the sentence, the descriptive translation approach involves providing a detailed and informative rendering of the original expression. Descriptive translation aims to convey the meaning while maintaining clarity and precision. The translated phrase, ‘the possibility of shear-induced bubble formation,’ seeks to elucidate the specific process implied by ‘shear-induced bubble formation.’ This approach prioritizes a thorough explanation to ensure that the reader comprehends the mechanism described in the original text.

The second trial, defined as cohort 2, included 396 adults who were not the best candidates for the open bypass because they did not have an adequate amount of the preferred saphenous vein. – Друге дослідження, визначене як когорта 2, включало 396 дорослих, які не були найкращими кандидатами для відкритого

шунтування, оскільки вони не мали достатньої кількості вен, які були неглибоко під шкірою. (*Bypass surgery favorable for initial treatment of chronic limb-threatening ischemia.* (n.d.-a).

In the translation of ‘preferred saphenous vein’ in the sentence, the descriptive translation approach involves providing a detailed and explanatory rendering of the original expression. The translated phrase, ‘an adequate amount of the preferred saphenous vein,’ seeks to describe the specific type of vein (‘saphenous vein’) that is preferred for the bypass procedure, emphasizing the importance of having a sufficient quantity of this particular vein.

Antonymic translation is a strategy in translation where the translator renders a term or phrase by using its opposite or antonym in the target language. This approach aims to convey the opposite meaning while maintaining structural equivalence. It is often used when a direct word-for-word translation might not capture the intended contrast or when the equivalent term in the target language is commonly understood as its antonym.»

Of course, mapping the stars is nothing new. – Звісно, карта зірок – це не що-небудь нове (Finkbeiner, 2024).

*The study further determined that NSAIDs with a long half-life or **slow-release formulation** are associated with a greater risk of GI bleeding or perforation. – Дослідження також встановило, що НПЗП із тривалим періодом напіврозпаду або формулою з **нешвидким вивільненням** пов’язані з більшим ризиком шлунково-кишкової кровотечі або перфорації. (*Flexible material shows potential for use in fabrics to heat, cool.* (n.d.).*

So, as a result of the research of 50 sentences – translations from scientific texts, there were detected 2 cases of descriptive translation and 2 cases of antonymic translation.

Let us consider the frequency of use of different methods of translation of terminological units in the English-language innovative and technological discourse (Fig. 2.1):

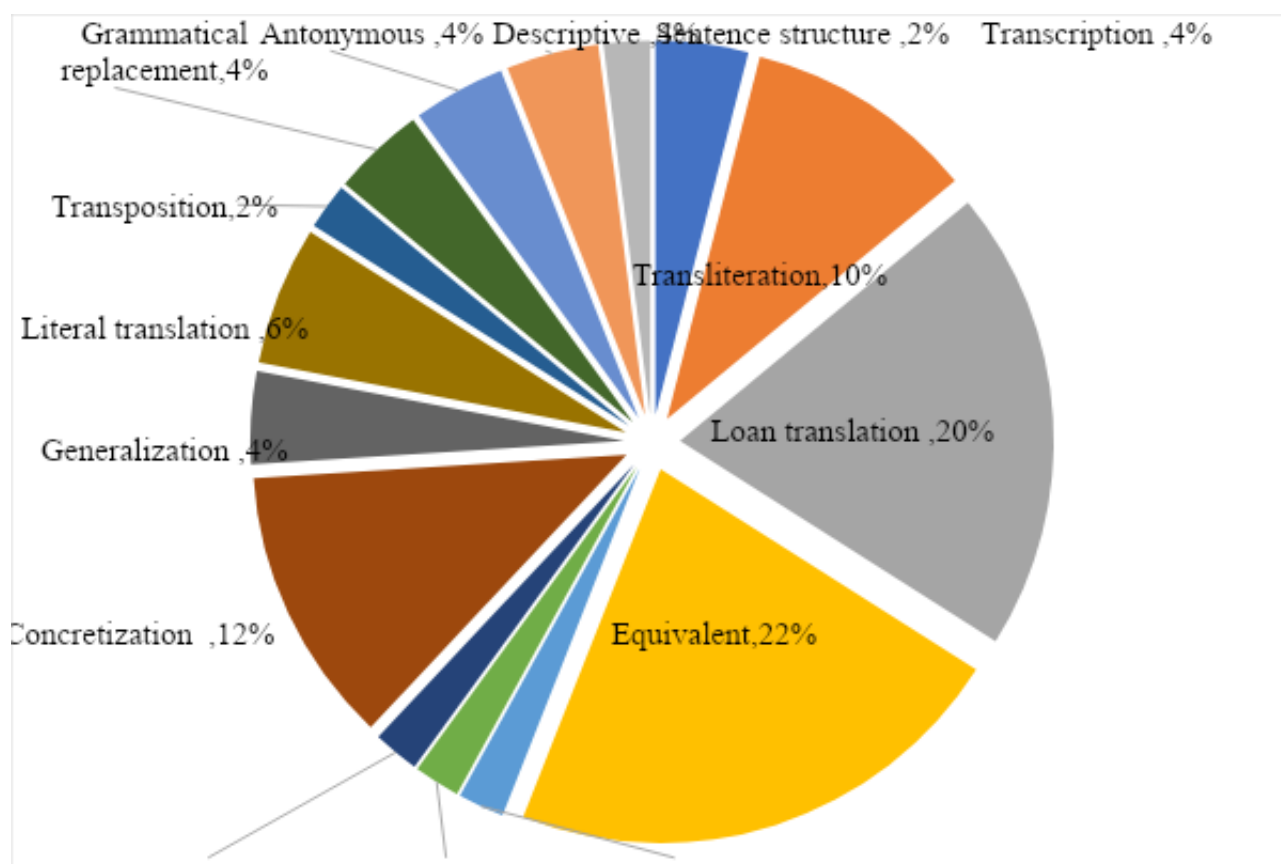


Fig. 2.1 Statistical ratio of the frequency of use of methods of translation of English scientific discourse

The statistical analysis of translation transformations in scientific discourse reveals a diverse range of strategies used by translators. Among the most frequently used transformations, equivalent translation and loan translation stand out as prominent choices, comprising 22% and 20% of the instances, respectively. These strategies emphasize the importance of maintaining both semantic and cultural fidelity in conveying scientific concepts. Furthermore, the prevalence of concretization at 12% underscores the significance of providing explicit and detailed renditions, particularly in scientific contexts where precision is paramount. The presence of transliteration at 10% highlights the acknowledgment of the need to incorporate original language elements to preserve specific terms that lack direct equivalents.

It is noteworthy that some transformations, such as lexical addition and modulation, are less frequently used, each constituting 2% of the total instances. This suggests a cautious approach to introducing new elements or adjusting the tone and style in scientific translations. Additionally, the distribution of transformations related

to sentence structure, including transposition, grammatical replacement, and descriptive translation, collectively accounting for 8%, reflects a balanced consideration of syntactic nuances. This balanced approach ensures clarity and coherence in conveying complex scientific ideas. In conclusion, the statistical breakdown reveals a nuanced approach to translation in scientific discourse. Translators navigate a spectrum of strategies, emphasizing precision, fidelity, and clarity, as they bridge linguistic and cultural gaps in the pursuit of effective knowledge transfer.

CONCLUSIONS

The literature on the translation of scientific articles within the field of Translation Studies encompasses a rich array of insights and methodologies. The literature underscores the multifaceted nature of scientific translation, acknowledging the challenges posed by technical terminology, disciplinary conventions, and the need for precision and accuracy. Researchers have delved into the intricacies of lexical choices, proposing strategies for maintaining fidelity to source texts while ensuring clarity and coherence in the target language. The role of translators in mediating between the scientific community and a broader readership is a recurrent theme. Studies emphasize the importance of considering the target audience, tailoring translations to meet their specific needs, and addressing potential challenges related to cultural and linguistic variations.

The most frequent way of translating the terms of the English-language scientific discourse is transliteration, loan translation, equivalent, concretization. This is explained by the dominance of the English language in most innovative fields of science and technology and the active processes of borrowing such vocabulary from other languages through transcoding by means of host languages. Another frequent method of translation is loan translation. The selection of an equivalent is less common, which is related to the innovativeness of many developments, and therefore the absence of their analogues in Ukrainian science (and, accordingly, the absence of their names). The least represented contextual translation. There are many factors affecting the effectiveness of interlingual communication in the professional scientific and information field. Thus, an adequate English-Ukrainian translation of special literature assumes, in particular, that the translated text will be subject to the laws of Ukrainian grammar and will correspond to the norms of functional stylistics.

In order to adequately and equivalently convey the terms of one language, which is the main component of its special vocabulary, into another language, certain methods of translation are used. The analysis showed that among the frequent methods of transferring English-language terms in the field of nanotechnology into

the Ukrainian language, loan translation, descriptive translation, selection of an equivalent or analogue, transcription and transliteration, specification and generalization, as well as contextual translation should be highlighted.

Prospects or ideas for possible further research in the area. The research topic presents a comprehensive landscape for potential further investigation. Several avenues for future research emerge from this topic. One avenue involves conducting a thorough corpus analysis of translated scientific articles to identify recurring patterns and challenges in semantic transfer. Focusing on specific scientific domains through in-depth case studies could provide insights into domain-specific translation challenges.

Exploring translator strategies, especially those used by experienced scientific translators, can offer valuable insights into decision-making processes and the use of glossaries. Additionally, evaluating machine translation tools in preserving semantic nuances and overall message content can be a relevant aspect of future research. Collaboration with scientists who are proficient in both English and Ukrainian can contribute a unique perspective on the accuracy and fidelity of translated scientific articles. Exploring pragmatic considerations, such as the impact of the intended audience on translation choices, offers another avenue for investigation.

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ANNEXES

Annex A

№	Original text Translation	Original text Translation	Transformation
1	Qubits composed of holes could be the trick to build faster, larger quantum computers	Кубіти, які складаються з отворів , можуть стати ключовим рішенням для побудови швидших та більших квантових комп'ютерів.	direct equivalent
2	The new smart catheter senses the start of an infection, and only then releases its antibiotic substance, which is nitric oxide	Новий розумний катетер відчуває початок інфекції і лише потім вивільняє антибіотичну речовину, яка є оксидом азоту.	direct equivalent
3	Collectively these projects have gathered images and spectra -stars' light spread out into its individual wavelengths – for millions of stars.	Колективно ці проекти збрали зображення і спектри (світло зір, розкладене на окремі довжини хвиль) для мільйонів зір.	direct equivalent
4	In this way, a quantum bit can be made robust against charge fluctuations stemming from the solid background.	Таким чином, квантовий біт може бути стійким до флуктуацій заряду, що виникають через твердий фон.	direct equivalent
5	To evaluate if their synthetic neurons can solve real-world problems, the researchers first wired 24 such nanoscale devices together in a network inspired by the connections between the brain's cortex and thalamus, a well-known neural pathway involved in pattern recognition.	Щоб оцінити, чи можуть їхні синтетичні нейрони вирішувати проблеми реального світу, дослідники спочатку об'єднали 24 таких нанорозмірних пристрої в мережу, натхненну зв'язками між корою головного мозку та таламусом, добре відомим нейронним шляхом, залученим до розпізнавання образів.	direct equivalent
6	With the radar , scientists can see down to the base of the sediments to reveal the top surface of the buried	За допомогою радару вчені можуть побачити основу відкладень, щоб виявити верхню	direct equivalent

	crater floor.	поверхню дна похованого кратера.	
7	Participants were then randomly assigned to have either a surgical bypass or endovascular procedure.	Потім учасники були випадковим чином розподілені на хірургічне шунтування або ендovasкулярну процедуру.	direct equivalent
8	The properties of formation water , which are related to well completion engineering, include mainly the pH value and total salinity. a. pH value	Властивості пластової води , які пов'язані з технікою завершення свердловин, включають в основному значення рН і загальну мінералізацію. а. значення рН	direct equivalent
9	Reservoir parameters constitute the basis for quantitative evaluation of the accumulation-permeation capacity and gas-bearing characteristics in volcanic gas reservoirs	Параметри колектора є основою для кількісної оцінки акумуляційно-проникної здатності та газоносних характеристик у вулканічних газових колекторах	direct equivalent
10	The latest star maps are rewriting the story of our Milky Way , revealing a much more tumultuous history than astronomers suspected –	Останні зоряні карти переписують історію нашого Чумацького Шляху , відкриваючи набагато бурхливішу історію, ніж підозрювали астрономи	direct equivalent
11	He carries in his mind a picture of what astronomers have been able to put together so far: a dense, barred center embedded in a layered disk of gas and stars, some of which pile up into arms that spiral through the disk.	У його уяві утримується зображення того, що астрономи досі змогли утворити: щільний, перегороджений центр, вбудований у шаруватий диск із газу та зірок, деякі з яких збираються у рукави , які спіралью обертаються крізь диск.	direct equivalent
12	As of 1993, ESA's previous star-mapping satellite, Hipparcos , had mapped 2.5 million stars; by 2023 Gaia had mapped around 1.8 billion of them.	На 1993 рік попередній зірковий космічний апарат ЄКА, Хіппаркос , відобразив 2,5 мільйона зір, а до 2023 року Гайя відобразила приблизно	transcription

		1,8 мільярда зірок.	
13	Ana Bonaca recently got her first faculty job, as a staff scientist at the Carnegie Observatories in Pasadena , but she's been interested in our galaxy since she was in middle school.	Нещодавно Ана Бонака отримала свою першу посаду наукового співробітника в Обсерваторіях Карнегі в Пасадені , але вона цікавиться нашою галактикою з середньої школи.-	transcription
14	Reaching these points will facilitate experimental efforts to preserve quantum information for as long as possible.	Досягнення цих точок полегшить експериментальні зусилля зі збереження квантової інформації якомога довше.	transliteration
15	Mice pass the mirror test, a classic indicator of self-recognition	Миші проходять тест з використанням дзеркала, класичного індикатора самовизнання	transliteration
16	They'd seen other galaxies merging with one another and looking unkempt, but they didn't know whether an earlier Milky Way might have done the same.	Вони бачили, як інші галактики зливаються одна з одною і виглядають недоглянутими, але вони не знали, чи раніше Чумацький Шлях міг зробити те саме.	transliteration
17	Ancient DNA recovered from Brazilian remains shows that syphilis and other treponemal diseases originated some 10,000 years earlier than previously thought –	Давня ДНК, отримана з бразильських останків, показує, що сифіліс та інші трепонемні захворювання виникли приблизно на 10 000 років раніше, ніж вважалося раніше	transliteration
18	The most notorious treponemal infection is venereal syphilis , which is generally caused by the subspecies <i>T. pallidum</i> but can be caused by other ones as well. –	Найвідомішою трепонемною інфекцією є венеричний сифіліс , який зазвичай викликається підвидом <i>T. pallidum pallidum</i> , але може бути спричинений і іншими.	
19	However, they provide	Однак вони надають	loan translation

	preliminary evidence that relatively small, simple diet adjustments can directly improve depression symptoms, and that these effects can last up to three months	попередні докази того, що відносно невеликі, прості корекції дієти можуть безпосередньо покращити симптоми депресії, і що ці ефекти можуть тривати до трьох місяців.	
20	The other strategy was an endovascular procedure – one performed inside the blood vessels where a balloon is dilated and/or a stent is placed in the blocked segment of the artery to improve blood flow.	Інша стратегія полягала в ендоваскулярній процедурі – виконанні всередині кровоносних судин, де балон розширюється та/або стент розміщується в заблокованому сегменті артерії для покращення кровотоку.	loan translation
21	The simulations revealed that flow slippage can be caused by tiny microbubbles that form on the pipe wall	Моделювання показало, що ковзання потоку може бути спричинене крихітними мікробульбашками , які утворюються на стінці труби.	loan translation
22	«The no-slip boundary condition of liquid flow is one of the most fundamental assumptions in fluid dynamics,» explains first author Yuji Kurotani.	«Гранична умова відсутності ковзання потoku рідини є одним із найбільш фундаментальних припущень у динаміці рідини», – пояснює перший автор Юджі Куротані.	loan translation
23	Volcanoes acted as a safety valve for Earth's long-term climate	Вулкани діяли як запобіжний клапан для довгострокового клімату Землі.	loan translation
24	The research team also measured the ability of the material to generate electricity using a difference in temperature, or thermal gradient , between two environments.	Дослідницький колектив також виміряв здатність матеріалу генерувати електрику за рахунок різниці у температурі, або теплового градієнту , між двома середовищами.	loan translation

25	A film made of tiny carbon nanotubes (CNT) may be a key material in developing clothing that can heat or cool the wearer on demand	Фільм, виготовлений з крихітних вуглецевих нанотрубок (CNT), може стати ключовим матеріалом у розробці одягу, який може обігрівати або охолоджувати користувача за його вимогою.	loan translation
26	Flexible material shows potential for use in fabrics to heat, cool -	Гнучкий матеріал виявляє потенціал для використання в тканинах для обігріву та охолодження.	loan translation
27	A second subspecies is most commonly linked to yaws , which cause skin lesions on the hands and feet. –	Другий підвид найчастіше пов'язаний з фрамбезією , яка викликає ураження шкіри на руках і ногах.	loan translation
28	A new study indicates holes the solution to operational speed/coherence trade-off, potential scaling up of qubits to a mini-quantum computer.	Нове дослідження вказує на можливість розв'язання торговельних робочих швидкостей та узгодженості шляхом виявлення переваги, а також потенційної можливості масштабування кубітів до міні-квантового комп'ютера.	loan translation
29	« Nanotechnology's main advantage over conventional medical treatments is its ability to more precisely target tissues, such as cancer cells targeted by chemotherapy. –	Основною перевагою нанонауки перед традиційними методами лікування є їхня здатність більш точно спрямовуватися на тканини, такі як ракові клітини, які впливають за допомогою хіміотерапії.	generalization
30	Overload training – or, training to exhaustion followed by a period of rest and recovery before a race – is a method used by many	Тренування з перевантаженням – або тренування до виснаження з наступним періодом або	generalization

	endurance athletes in search of a personal best. –	відпочинком і відновленням перед гонкою – це метод, який використовують багато спортсменів на витривалість у пошуках особистого рекорду.	
31	As the lake dissipated over time , the sediments in the crater were eroded, forming the geologic features visible on the surface today.	З часом, по мірі висихання озера , відклади в кратері піддалися ерозії, утворюючи геологічні особливості, які зараз видно на поверхні.	lexical addition
32	The interaction that enables spins to talk to electric fields is called the spin-orbit interaction, and is traced all the way back to Einstein's theory of relativity. –	Взаємодія, яка дозволяє спінам взаємодіяти з електричними полями, називається спін-орбітальною взаємодією, і вона веде свій початок аж до теорії відносності Ейнштейна.	modulation
33	One solution is to divide sound into two types of components , sines and noise, with a smaller number of whistling sine waves and combined with variable noises, or hisses, to complete the imitation.	Одним з рішень є розділення звуку на два типи складних комплектуючих , синусів і шуму, з меншою кількістю свистячих синусоїдальних хвиль і в поєднанні зі змінними шумами або шипінням для завершення імітації.	concretization
34	This study is limited in that the no change group received no intervention -- ideally, this group would have received alternative diet instructions, check-ins and monetary contributions to parallel the diet change group.	Це дослідження має обмеження у тому, що група «без змін» не отримала жодного втручання – ідеальною ситуацією було б надання альтернативних інструкцій до дієти, контрольних візитів та фінансового заохочення для паралельного порівняння з групою зміни дієти.	concretization

35	Each group member also received two subsequent check-ins via phone call.	Кожен член групи також отримав дві наступні реєстрації через телефонний дзвінок.	concretization
36	They named the wrong-way batch , which was bean-shaped, Sausage. –	Вони назвали цю групу зірок, які рухались не за звичайним шляхом , і мали форму боба, «Ковбасою».	concretization
37	New brain cell-like nanodevices work together to identify mutations in viruses	Нові наноактюатори , схожі на клітини головного мозку, співпрацюють для виявлення мутацій вірусів.	concretization
38	Hence, by mimicking how the brain solves these types of tasks, Williams said brain-inspired or neuromorphic systems could potentially overcome some of the computational hurdles faced by current digital technologies. –	Отже, наслідуючи те, як мозок розв'язує ці типи завдань, Вільямс висловив думку, що системи, подібні до мозку людини , або неуроморфні системи, можуть потенційно подолати деякі обчислювальні труднощі, з якими стикаються сучасні цифрові технології.	concretization
39	A second period of deposition occurred when fluctuations in the lake level allowed the river to deposit a broad delta that once extended far out into the lake, but has now eroded back closer to the river's mouth.	Другий період відкладення відбувся, коли коливання рівня озера дозволили річці утворити широку дельту, яка колись простягалася далеко в озеро, але тепер розмилася ближче до гирла річки	literal translation
40	The rover, which is about the size of a car and carries seven scientific instruments, has been exploring the 30-mile-wide crater, studying its geology and atmosphere and collecting samples since	Марсохід, який є розміром приблизно з автомобіль, і несе сім наукових інструментів, досліджує кратер шириною 30 миль, вивчає його геологію та атмосферу та збирає	literal translation

	2021.	зразки з 2021 року.	
41	If life ever existed on Mars, the Perseverance rover's verification of lake sediments at the base of the Jezero crater reinforces the hope that traces might be found in the crater.	Якщо життя коли-небудь існувало на Марсі, перевірка марсоходом Perseverance озерних відкладень біля основи кратера Jezero зміцнює надію на те, що сліди можуть бути знайдені в кратері.	literal translation
42	Says Kurotani, «The results of our project can help design new pipes that transport viscous fluids, like fuel and lubricants, with much smaller energy losses .	Куротані каже: «Результати нашого проекту можуть допомогти розробити нові труби, які транспортують в'язкі рідини, наприклад паливо та мастила, з набагато меншими втратами енергії .	transposition
43	Kumar added that another arduous task for digital machines is pattern recognition, such as identifying a face as the same regardless of viewpoint or recognizing a familiar voice buried within a din of sounds .	Кумар додав, що ще одним важким завданням для цифрових машин є розпізнавання патернів, таких як ідентифікація одного й того ж самого обличчя незалежно від точки зйомки або розпізнавання знайомого голосу серед шумів .	grammatical replacement
44	It's 'the single largest increase in astronomical knowledge in, like, forever,' says Charlie Conroy of Harvard University. 'It's been shocking.'	Це «найбільше збільшення астрономічних знань за весь час», ззначив Чарлі Конрой з Гарвардського університету. «Це було шокуєче».	grammatical replacement
45	The more generations of stars that have lived and died in a galaxy's gas, the more metal-rich are the new stars born inside it; the more metal-rich, the younger the star.	Чим більше поколінь зірок жили і померли в газі галактики, тим більше новонароджених зірок у ній мають високий вміст металів. Чим більше металів, тим молодша зірка.	sentence structure
46	In 2017 Bonaca and her team	У 2017 році Бонака та її	sentence

	found a batch of Milky Way stars in the wrong place: they were in the old, metal-poor halo and had the orbits of old halo stars, but they had the metal-rich chemistry of younger stars from the Milky Way's disk.	команда знайшли групу зірок Чумацького Шляху не в тому місці. Вони перебували в старому гало з бідним вмістом металів і мали орбіти старих зірок гало, але мали хімічний склад, багатий металами, як молодші зірки з диску Чумацького Шляху.	structure
47	By including the possibility of shear-induced bubble formation , they find that, contrary to the assumptions of many previous works, fluids can experience significant slippage when in contact with fixed boundaries.	Враховуючи можливість утворення бульбашок під впливом зсуву , вони приходять до висновку, що, навпаки до припущень багатьох попередніх робіт, рідини можуть демонструвати значне злипання при контакті з нерухомими межами.	descriptive translation
48	The second trial, defined as cohort 2, included 396 adults who were not the best candidates for the open bypass because they did not have an adequate amount of the preferred saphenous vein .	Друге дослідження, визначене як когорта 2, включало 396 дорослих, які не були найкращими кандидатами для відкритого шунтування, оскільки вони не мали достатньої кількості вен, які були неглибоко під шкірою	descriptive translation
49	Of course, mapping the stars is nothing new.	Звісно, карта зірок – це не що-небудь нове	antonymic translation
50	The study further determined that NSAIDs with a long half-life or slow-release formulation are associated with a greater risk of GI bleeding or perforation.	Дослідження також встановило, що НПЗП із тривалим періодом напіврозпаду або формулою з нешвидким вивільненням пов'язані з більшим ризиком шлунково-кишкової кровотечі або перфорації.	antonymic translation

РЕЗЮМЕ

Курсова робота висвітлює особливості семантичного переносу та збереження змісту повідомлення під час перекладу наукових статей з англійської мови на українську. Досліджуються важливі аспекти, які впливають на точність та адекватність передачі інформації у перекладі наукових текстів. Автор розглядає різні види трансформацій, що використовуються в процесі перекладу, такі як еквіваленти, транскрипція, транслітерація тощо. Особлива увага приділяється аналізу різноманітних методів семантичного переносу та їх впливу на передачу ключового змісту статей. На конкретних прикладах наукових матеріалів проводиться детальний аналіз ефективності використання різних трансформацій у процесі перекладу. Дослідження розкриває особливості семантичного переносу від англійської до української мови та визначає виклики, з якими стикаються перекладачі під час роботи над науковими текстами. Робота важлива для розуміння та вдосконалення методів перекладу в контексті наукової дискусії.

Ключові слова: переклад, семантичний перенос, збереження змісту, трансформації, наукові статті.