BATUMI SHOTA RUSTAVELI STATE UNIVERSITY

Faculty of Humanities

Department of European Studies

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Presented for the academic degree of Doctor of Philology

A B S T R A C T

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The defense of the dissertation will take place on _____ at the meeting of the Dissertation Board of the Faculty of Humanities at Batumi Shota Rustaveli State University. Address: 35 Ninoshvili Str, 2nd floor, room 37.

The dissertation is available at BSU Ilia Chavchavadze library and the BSU website (www.bsu.edu.ge).

Secretary of the Dissertation Board: Doctor of Philology, Professor Maia Kikvadze

Introduction

In the modern world, in the conditions of universal globalization, the role of translation, in particular scientific translation, has increased dramatically. Humanity has faced with global challenges: natural and social cataclysms require joint efforts. The post-industrial society has undergone a transformation into a post-informational one, where information (that is, knowledge) is actively exchanged. One of the proofs of this is numerous international projects, within the framework of which intensive scientific research activities are carried out with the joint efforts of scientists from different countries. Among them is the project "Exchange of knowledge. Europe and the Black Sea Region" (KEAC-BSR- Knowledge Exchange. Europe and the Black Sea Region - exchange of knowledge and academic culture in the humanitarian field in the Black Sea region), which is carried out by the efforts of an international consortium. Within the framework of the project, interdisciplinary studies were conducted, the goal of the research carried out by linguists was to study the role of translation in the development of science, in particular - the development of scientific translation.

Translation is an ancient type of human activity. It can be said that translation has always played an important role in the history of mankind and is still relevant to this day, because successful communication, exchange of knowledge and experience is necessary for the development of mankind, which became possible as a result of translation activities.

According to the UNESCO statistical reference "Index translationum" of 1980, which publishes data on the translated literature of 61 countries of the world, a total of 50,410 works have been translated, of which 23,904 are fiction, and 7,678 are scientific: exact, natural and applied science texts. It should also be noted that translations of articles, journals, administrative and technical texts are not included in the directory.

Many facts, such as Sumerian manuscripts created before our era, including bilingual dictionaries, show that there was a need for translation and that there were translators who apparently used these dictionaries in their translation.

Translation has always had an important social function, allowing people speaking different languages to communicate. Thanks to written translation, different ethnic groups were

able to learn about the cultural identity and achievements of other nations, communication and cooperation between cultures with different languages became possible. Thanks to the translation, the works of Dante, Shakespeare, Homer and other genius writers and poets gained immortality.

The role of translation in the development of religion is also great, just as religion has made a great contribution to the formation of translation. In the Middle Ages, Christianity became the leading religion of European countries, as a result of which writing developed in Europe. The translation of the Middle Ages did not have an "author's style", the centers of translation activity were monasteries, where learned monks translated. As a rule, the identity of the translators was not recorded, so their identity is unknown to this day, although the name of some of them has been preserved by the chronicler, such as, for example, the Gothic monk Wulfila (IV century), who created the Gothic alphabet in order to translate the Bible. It can be said that the translation of religious literature became the starting point for translation studies, because it was around the translation of the Bible that issues of translation quality arose.

Special importance was given to translation in the background of the expansion of international relations in the period after the two world wars, it should also be noted the creation of the League of Nations and the United Nations, which led to the formation of the information society, as a result of which the demand for translation and translators increased.

After the Second World War, during the "Cold War" period, issue of the need for development of science arose, when the world turned into two large opposing military-political camps.

After the end of the "Cold War", the situation in the world has changed radically. Against the background of today's globalization, when the world is faced with universal problems: natural and social cataclysms require the gathering of joint forces.

XX-XXI centuries are especially distinguished by the rapid development of science where the search for new ways to solve problems, the formation of new concepts and theories is ongoing. With the rapid development of science, the demand for scientific literature and textbooks is increasing. The need and role of scientific translation is indisputable in our time, because in the era of rapidly developing technologies, when information, news and latest

achievements are so actively covered through print and many other sources. It is especially relevant to publicize scientific achievements and technical innovations, so that the achievements of one country's science become available to other countries. One of the most important directions is the history of the development of scientific translation, which is part of our dissertation topic.

Relevance of the issue: When talking about the situation of scientific translation in Georgia, one cannot fail to mention the deficiency in the field of translation, which is due to the fact that the country lived in a rather closed space in the last century and the society would get acquainted with foreign scientific literature mainly in Russian. It should also be said that often, the Georgian translation was completed from Russian, as an intermediate language. For years, under the conditions of the Cold War and the Iron Curtain, it did not contribute to the proper development of the Georgian translation school.

In the twenty-first century, against the background of the fastest development of science and technology, the demand for Western or American scientific works has increased, naturally, the intensity of Georgian translation has increased, including in the scientific field. Nowadays, the problem of the quality of scientific translation is quite acute, which is caused by various factors, including: lack of resources focused on a specific scientific field, scarce practical experience, lack of studying the specificity of Georgian scientific translation against the background of the universal natural phenomena of scientific translation.

The above shows the relevance and importance of our doctoral research. The results obtained in the research process were systematically approved at the international conferences held within the framework of the mentioned scientific project.

The purpose of our research is to study the specificity of scientific translation and to understand its role in the process of science exchange. To achieve this goal, the research set the following specific task:

1. to cover the translation activity and the formation of translation study in Georgia;
2. to analyze the role of translation in the development of science;
3. to study the peculiarities of scientific discourse;
4. review the establishment and development of the Georgian terminological system;

5. to analyze the linguistic nature of scientific terms and the adopted strategies of their translation;
6. Compile a typology of scientific discourse mistakes and develop recommendations.

The novelty of the conducted research derives from the objectives of the research, in particular, the translation activity is analyzed in a new light - from the point of view of the development of academic culture and the role of translation in the process of knowledge exchange. The specificity of scientific translation are understood, the strategies and techniques used in the translation of scientific discourse on English-Georgian material are discussed. A typology of mistakes is presented and recommendations are developed.

The theoretical and practical value of the paper is the review of the existing theoretical material, the discussion of Georgian and foreign scientific literature, the deepening of a number of terms and concepts, the understanding of the historical stages of scientific translation in Georgia. The conclusions and recommendations obtained as a result of the research will be of great help to translators in translating scientific discourse.

The research methodology represents a combination of qualitative and quantitative methods: the method of critical analysis of scientific literature, the method of working with sources, discourse-analysis, comparative-historical method, etc.

Structure of the paper: the paper consists of an introduction, three chapters divided into paragraphs, followed by concluding statements, a bibliography, a list of Internet sources and an appendix.

Chapter I

Translation activity and translation studies

1.1. At the origins of the translation activity

The history of translation gives us an idea of the cultural, linguistic, political, historical, religious, technological, literary situation, but due to the ambiguity of the information, it is not so easy to create a single whole picture. Therefore, it is better to highlight special aspects of the history of translation. As our field of interest is scientific translation, in this work we would like to focus on the history of scientific translation, which is not presented separately, but one can trace its centuries-old existence and development in the history of general translation.

The history of scientific translation covers the field related to the knowledge acquisition, dissemination and exchange.

There is no universally accepted periodization of the history of translation, nor is the exact date of its origin known, but ancient archeological materials testify to its existence as early as the ancient BC. time. The first examples of translation have been found and date back to about III century.

Translation work was popular in antiquity, when prominent ancient Greek and Roman poets, philosophers and orators were also translators and expressed their opinions about translation. For example, Cicero (106-43 AD) translated and even wrote a lot about translation. The theoretical formulation of the tasks of translation is given in the preface to his translation of "The Conversations of Aeschines and Demosthenes", where the contrast between free and literal translation is outlined.

In the Middle Ages, when the spread of Christianity was actively going on in Europe, the Bible was mainly in the center of attention and the literal translation dominated, because it was about the holy book and it was not allowed to change the holy words. The translation of the Bible contributed to the development of not only religion, but also philosophy and other branches of science. Schools were created where, in addition to translation work, teaching was carried out, which contributed to the advancement of education and, of course, science.

In this period it is noteworthy such figures as St. Jerome, John Wycliffe, Tyndall, King James, Martin Luther, Agricola, Francis Bacon, and others who were not only active translators, but also formulated theoretical views on translation. Their role in the development of the national language is also great.

Although knightly novels became popular in Europe in the 12th-13th centuries, the translation of scientific literature did not stop.

In the 12th century, a translation school was established in Toledo (Spain), which was known as the Toledo School and which existed for about 200 years. Philosophical, medical, mathematical, astronomical and astrological treatises were translated at the school. It is thanks to the school of Toledo that Avicenna's work has reached us.

As for the Renaissance, secular literature, art and science became popular in Europe from the 14th century. This period is characterized by the revival and flourishing of translation. Naturally, not only translation practice was developed, but also theoretical views, where the task of translation was to convey the content and essence of the source text as much as possible in the target language, observing the linguistic norms. In this regard, Etienne Dole's treatise "On the ways of good translation from one language into another" published in 1540 is worth noting.

All of the above indicates mainly the development of religious and secular literature, however, this does not mean that scientific works were not translated. Along with the Bible and fiction, treatises from medicine and other scientific fields were translated. Elizabeth Tempel mentions the translation of several scientific works in her collection of Anglo-Saxon manuscripts. Among them, the Anglo-Saxon translations of the herbarium (Herbarium) associated with the name of Apelius and the "Medicine de quadripedibus" of Sextus Placitius, dated the 11th century(Temple 1976 :81).

186. Page from Herbal. London, B.L., Cotton, Vitellius C. III, f. 56v (Cat. 63)

Levon Ter-Petrosyan's work "Ancient Armenian Translated Literature", based on ancient manuscript sources, contains very important data on the translation of scientific texts. The paper talks about the fact that in addition to the Bible and other religious texts, scientific literature was translated. Translations covered various fields of science: grammar, rhetoric, philosophy, natural science, theology. According to the author's data, translation of not only religious but also scientific literature from Georgian to Armenian language was active.

But the development of scientific translation became more active during the scientific revolution and later, in the 17th - 18th centuries.

Parallel to Europe, translation practice was actively conducted in Russia and Georgia.

As for the period after the Second World War, the attention of mankind has mostly shifted to the development of science and technology, and naturally, the demand for scientific translation and its role has increased even more.

1.2. Formation of translation studies and stages of its development

Translation studies is a relatively young discipline. As a result of many centuries of translation activity, humanity has accumulated a lot of experience, which laid the foundation for the formation of translation theory as a scientific discipline. The first theoreticians of translation were the practicing translators themselves, who tried to generalize their own and other

translators' practical experience. Naturally, such theorists were prominent translators of their time.

The term "translation" has many definitions. The explanatory dictionary of the Georgian language offers the following definition:

Translation (translation) 1. A text or word translated from one language to another.

Different researchers define it in different ways. As for the definition of translation in a narrow sense, we will rely on and be guided by the definitions set forth by Garbowski and Bell and laconically conclude that a translation is an adequate conveying/rendering of an already existing source text from one language to another with maximum equivalence.

Many scientific disciplines study translation, but translation studies is a branch of science that studies translation as a process and a product of this process, studies translational transformations, analyzes translation solutions and execution technology. Like translation, the term "translation studies" has many definitions.

A relatively better attempt to present the historical development of translation belongs to J. Steiner, the author of the book "After Babylon". He distinguishes 3 periods, but emphasizes the amorphousness of their boundaries. I period - the most extensive - I-XVIII cc: begins with Cicero's discussions on literal and free translation and Horace's work "Poetic Art" and continues until the beginning of the 19th century. II period - the stage of theory and hermeneutic research - from the beginning of the 19th century to the middle of the 20th century. This is the era of defining the essence of translation and its philosophical-poetic theory. The III period - modern - starts from the second half of the 20th century." (M. Aroshidze, N. Aroshidze 2018: 7).

Translation research was established as an independent scientific discipline in the second half of the 20th century. As Lev Nelyubin notes, "in the 1950s and 1960s, translation studies received official recognition as a special discipline with its own research object, its own structure and methods" (Nelyubin 2009: 33).

The following stages can be distinguished in the formation of translation studies:

1. applied stage - translation creative activity;

2. transitional stage - translation activity and generalization of experience;
3. The first scientific paradigm - interliterary translation theory;
4. the second translation paradigm - linguistic translation theory;
5. The third anthropocentric translation paradigm - linguo-cultural translation theory.

1.3. Translation and translation studies in Georgia

Georgia is a small country of ancient culture, in which the importance of translation has been understood since time immemorial. Translation activity in Georgia was active in more or less all historical eras, but, in the review of the history of Georgian translation, according to M. Aroshidze and N. Aroshidze, the several stages of so-called translation boom are outlined:

I stage -from around IV-V century B.C. (or earlier) to XI-XII century; During this period, translation was mainly done from Greek and Latin languages. The translated material was mainly of a religious nature, namely the Bible and other scriptures, which was caused by the spread of the Christian religion. This was facilitated by the fact that educational centers throughout Georgia, as well as in the rest of the Christian world, were managed by churches and monasteries, e.g. Gelati and Ikalto Academies. Type of translation - literal. The translation was carried out by outstanding and prominent churchmen of that period: Ekvtime of Athon, Giorgi Mtatsmindeli, Ioane Petritsi, Ephraim the Lesser, Arsen Ikaltoeli, etc.

II stage - from about the 12th century and lasted until the 16th-17th centuries; From this period, the situation changed and Georgian translators actively started translating secular literature, which was mainly translated from Persian. The translation type was free.

III stage – XVIII - until the 80s of XX century. This period is characterized by close relations with Russia, which led to translations mainly from Russian. Much attention was paid to the development of learning and education, which contributed to the creation and translation of scientific works. Prominent translators of this period were: Anton Katholikos, Sulkhan-Saba Orbeliani, Bakar Batonishvili, Vakhushti, Teimuraz, Ioane and Davit Bagrations, King Archil the

First, Gaioz Rector and others. In the 1980s, such authors as Givi Gachechiladze, Giorgi Tsibakashvili, Dali Panjikidze, Otar Bakanidze should be mentioned.

IV stage - from the end of XX to the present day. During this period, against the backdrop of socio-political changes, the Russian language, which had prevailed until now, was replaced by English. The demand for Western or American scientific works has increased, naturally, the intensity of Georgian translation has increased, including in the scientific field.

Chapter II

The role of translation in the development of science

2.1. The Scientific revolution and translation

Presumably, translation has existed since olden times and was involved in various social processes, but the special growth of translation activity is connected with the development of science, which reached the peak of its activity and relevance during the scientific revolution. When we talk about the scientific revolution, we mean the emergence of theoretical science, while the cognitive activity of mankind, which laid the foundation for the conception of theoretical science, took place with various intensities throughout the entire development of mankind.

There is no doubt about the role of science for modern humanity, but it has not always been this way. For centuries, religion denied the importance of science, explaining that all necessary knowledge was contained in holy books. Fortunately, the situation changed later, and during the Enlightenment, the society of that time began to properly understand and appreciate science. During this period, there is an active interest in science.

The scientific revolution of the XVI-XVII centuries is a period of cardinal changes in the field of scientific knowledge of the world, thanks to which the model of modern knowledge was formed.

In the development of science, there are periods when all the components of its foundations undergo a fundamental transformation. These periods can be considered as a global revolution, which causes radical changes in one or another field. 4 such global revolutions are distinguished:

1. The first global scientific revolution - XV-XVII centuries.
2. The second global scientific revolution - the end of the 17th century and the beginning of the 18th century.
3. The third global scientific revolution - from the 18th century to the second half of the 20th century.
4. 4- The fourth global scientific revolution - the period from the last third of the XX century.

2.2. Georgian science and translation

A new stage in Georgian scientific and translation activity begins in the 18th century and continues until the end of the 20th century. This period is characterized by close relations with Russia, which led to translations mainly from Russian.

During the revival of Georgian writing (XVII-XVIII centuries), during the period of cultural renaissance, special attention was paid to primary and secondary education in Georgia. In 1755, the theological-philosophical seminary started working in Tbilisi with Filipe Kaitmazashvili as the rector. Apart from being an educator, he also worked as a translator. He was translating philosophical and theological literature.

The development of learning and education contributed to the creation and translation of scientific works. The interest of Georgians in the achievements of European science was special. The scientific records of the Institute of Oriental Studies contain data on the translations of the 18th-19th centuries. Antique philosophical treatises and texts of first centuries B.C, works of Western European scholars of the XVII-XVIII centuries and others were actively translated. Prominent scientists and translators of this period were: King Archil I, King Vakhtang VI, Anton Catholicos, Sulkhan-Saba Orbeliani, Davit Bagrationi, Alexander Amilakhvari, Gabriel Gelovani, Dositeoz Cherkezishvili and others.

2.3. Dissemination of science and knowledge and the role of translation

The circulation and exchange of knowledge has probably occurred since olden times, when the first societies formed about 10,000 years ago. The exchange of more specific scientific knowledge began after the emergence of modern sciences in Western and Eastern Europe in the 16th and 17th centuries.

K. Kasser and D. Gutmeyer in their article "History of the Early Knowledge Exchange" talk about the exchange and dissemination of knowledge and note that historically, the area where the scientific revolution took place in the XV-XVIII centuries was part of the Holy Roman Empire of the German nation and its neighboring countries.

K. Kasser and D. Gutmeyer pointed out that we should mainly distinguish between the exchange of knowledge and research methods between universities, academies and individual scholars at the regional, national, transnational and global levels, as well as between experts, non-experts and emerging experts such as students.

According to them, in addition to other visible factors, three important elements influenced the forms of scientific communication over time, first of all, it is the exchange of technologies and their transformations. As well as the transition from oral to electronic communication, various media - writing, print, telecommunications and digital forms of exchange - have significantly affected the conditions of knowledge production, scholarly exchange and content.

As the second important element, they name translation as one of the most relevant methods of communication and conclude that: "... without the translation of books and articles into other languages, knowledge exchange would be very limited" (Kasser, Gutmeyer, 2018:19).

If we look at the process of science and knowledge dissemination, we will clearly see the role of translation in the development of science.

Researcher Basala offers us an interesting three-phase model of scientific progress and knowledge dissemination. According to Basala, in the 16th and 17th centuries, modern science emerged geographically in Western European countries: Italy, France, England, Germany, Holland, Austria and Scandinavian countries. In scientific-historical circles, the question is often asked why scientific science emerged in Western Europe, but Basala formulates the issue in a

different way: how did science and knowledge spread from Western Europe to other countries of the world.

The first phase, when scientific knowledge was transferred outside of Europe. According to the researcher, the first phase is characterized by the spread of knowledge by Europeans, when they traveled to new lands, studied their flora and fauna, physical characteristics, and then took all these data back to Europe.

The second phase, which Bassala calls the phase of colonial science, began much later than the first phase, but reached a larger scale, because during this period much more scholars and researchers were involved in scientific activity. At this point national, but still dependent, colonial science was formed on the European knowledge base.

Basala calls the third phase the independent scientific tradition, when colonial science became an independent science. During this period, the demand for translation increased, which greatly contributed to the ongoing processes at the third phase stage.

On the basis of Basala's research, we can add that science can be formed in local society, but it is a part of international science and is the property of humanity. An obvious example of this is the 21st century with its globalization, when different linguistic world sciences focus on common tasks and problems despite the language barrier, which modern society successfully overcomes thanks to translation. This once again proves the importance of translation and its great role in the development of world science.

2.4. Scientific discourse and its formation

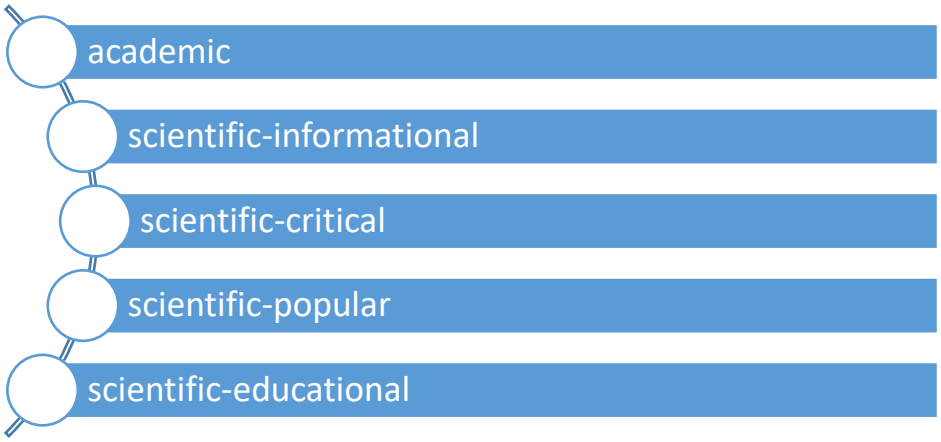
Discourse - definition and classification

There are different ways of understanding discourse in modern humanities. The term "discourse" was formed within the framework of French linguistics and means running here and there, movement, speech. Discourse is speech with all the nuances and specificity of life. It is the realities of life that represent the pragmatic aspects.

Our focus is scientific discourse, which includes various types of scientific texts, including articles, monographs, etc.

It is characterized by scientific language, abundance of terms, objectivity, logic, empiricism, methodology, criticality.

The following types of text are distinguished in scientific discourse:



Scientific discourse is characterized by an abundance of terms. The peculiarity of their translation is one of the key moments in the mentioned discourse, and therefore, we should pay special attention to the specificity of their translation. In our paper, we focused on the problem of translation of terminology.

The difficulty of translating terms can be caused by various factors, one of which is the terminology system of the target language. That is why, in the next subsection, we will discuss the specificity of the Georgian terminological system and the difficulties related to it.

2.5. Problematics of the Georgian terminology system

One of the reasons for the problem of Georgian translation of terminology is the scarcity of new Georgian scientific terminology, which is due to the fact that there is no legalized system of creating a unified terminology. When translating, terms are often used subjectively and are not verified in the terminology system.

Nowadays, the Georgian language, including the scientific language, is greatly influenced by English, which is caused by the technological progress of the 21st century. Thus, the Georgian language is facing a considerable difficulty. Previously, the terms were translated from the Russian language, as a result of which the Georgian terminological system was created. In our era, the Russian language was replaced by English, and unfortunately, terms are not translated

into Georgian in many cases, but the English word is used directly, as a result of which foreign words have multiplied in modern Georgian, which may have a negative impact on the language over time. Foreign words are abundant not only in the spoken language, but also in the scientific field.

The absence or lack of a strictly established system of terminology in modern Georgian makes the translation of scientific discourse even more difficult. Therefore, it is necessary to create a unified terminological system, which individual translators and specialists in the field will not form independently, but a specially created commission should deal with this issue, where translators, field specialists, linguists and other professionals will jointly develop the norms of terminology. In this way, as a result, we will get a unified universally recognized terminological system, which, on the one hand, will contribute to the development-enrichment, refinement-correction of the Georgian scientific language, and on the other hand, will simplify the issue of terminology translation, which will help translators in the future to avoid mistakes caused by similar problems.

Chapter III

Translation of scientific discourse

3.1. Specificity of scientific discourse translation

From the history of translation, it can be seen that translation has a great role in the development of civilization and, in particular, science.

Within the framework of the KEAC-BSR project, over the past three years, we have studied texts from various fields of scientific discourse. In the paper, we covered two relatively more relevant genres - information technologies and the medical field, on the example of which we will briefly discuss the specificity and difficulties of the translation of scientific discourse.

Scientific discourse, like all other genres, has its own lexical and grammatical features that are common to all its fields.

The translation of scientific discourse must meet a number of requirements in order for it to be considered a high-quality, adequate translation of the original text. Such basic requirements include:

- accurate and correct translation of foreign language text;
- compliance and protection of style, which means conveying the idea as accurately and logically as possible;
- It must conform to the literary and visual norms of the target language in order to maintain linguistic standards, which means that the translation of the linguistic features of the original into the target language is unacceptable.

We would like to emphasize that we see the main problem of scientific translation in the transcoding of terms. That is why the analysis of the linguistic nature of the terms, the peculiarities and problems of their translation turned out to be the focus of our practical research.

3.2. Linguistic nature of scientific terms and common strategies for their translation

One of the most significant features of scientific discourse is the abundance of terms and set expressions, which are conventionally divided into two parts:

- Terminology and phraseology of a general scientific nature (research results, research object, research methodology, etc.);
- Terminological system of a narrow scientific field (for example, mathematical terms, terminology of nuclear physics, etc.).

The basic unit of any terminology is the term.

In terms of translation practice, the terms can be divided into 2 groups:

- Terms with equivalents in the target language;
- Terms for which no matches are found in the target language.

All narrow fields, on the one hand, have such a terminological system that is common to the given discourse, and on the other hand, terms characteristic only for it, which are determined by the specificity of this particular field. This fact is clearly visible when analyzing the functionality of text units. We would like to highlight some terms that have different functions in the field of scientific discourse. This is a case of obvious homonymy, but unlike intra-linguistic homonymy:

e.g. bar - ბარი, and interlanguage homonymy: e.g. actual - ფატობრივი და არა აქტუალური, we can call such words intra-discourse homonymy.

e.g. ***Gate:***

general	*ჭიშკარი,შესასვლელი ,საგუშაგო, კარიბჭე, შლაგბაუმი*
General technical	*საფარი, საკვალთი, საკეტი, სარქველის საფარი; სახლვაო - შლუზი*
hydraulic	*ფარი, საკეტი; სამთო - შტრეკი, გადასაგორი მასალა*
marine	*შლუზი*
airport	*გასასვლელი*

Terminological metaphors are particularly difficult. Such terms, which contain a metaphorical expression, are called metaphorical terms or terminological metaphors, or more briefly, term-metaphor.

Original	Georgian translation	Russian translation
lean concrete	*თხელი ბეტონი*	*тощий бетон*
dust arrest	*მტვერის დაჭერა-*	*улавливание пыли*
jaws	*მარწუხი*	*тиски, зажим,*
mole	*გვირაბის ექსკავატორი / თხუნელა*	*туннельный экскаватор/крот*

Metaphorical terms function as names of new technical objects, at the same time they carry connotational information, which can be considered as their realization of a cognitive function.

As a result of the analysis of examples of metaphorical terms, several ways of their transformation were identified:

1. Metaphor in the source language was also translated into the target language as a metaphor;
2. Metaphor in the source language was translated into the target language as a term;
3. And on the contrary, a term in the source language was translated into the target language as a metaphor;

Because dictionaries often fail to keep up with developments in science and technology, it is often impossible (difficult) to find an equivalent of a term in the target language. Translation theory provides several ways of translating terms that do not have such matches, which are successfully used by translation practitioners. A number of works are devoted to the issues of translation techniques, where all possible translation transformations used during translation are discussed in detail. Different scientists offer their classification. In this work, we focused on the classification of some of them.

In French linguistics, according to the classification of translational transformations presented by Jean-Paul Vinay and Jean Darbelnet, two groups are distinguished:

1. Direct
2. Indirect

Direct	borrow
	loan translation
	word for word translation

Indirect	transposition
	modulation
	equivalence
	adaptation

As the difference in terminoly systems is one of the important difficulties in translating scientific and technical discourse, the use of commonly accepted, officially fixed meanings is considered a relatively reliable strategy.

As we mentioned above, the scientific and technical discourse covers various fields, in this paper we tried to show the general features and difficulties of the translation of this discourse on the example of several fields, namely information technologies and medical literature.

Today, technology exists in all areas of our lives. Information technology (IT) is an integral part of our daily activities. It has changed the way of communication, which is also reflected in the language: more and more new IT terms appear regularly, especially in English, which must be translated into many other languages, so that the countries of the world do not lag behind the technological progress.

IT translation is a part of scientific translation that provides translation in the field of information technology. As a result of technological progress and computerization, new special vocabulary is created in different languages. A new term is formed and established, which in turn presents a certain difficulty in translation.

Computer terms can be conventionally divided into the following groups:
The first group includes terms that have equivalents in the target language.

Original	*Georgian translation*	*Russian translation*
Hard Disk	მყარი დისკი	жесткий диск
Desktop	სამუშაო მაგიდა	рабочий стол
Save	შენახვა	сохранить
Send	გაგზავნა	отправить

The second group included the terms transferred by transcription/transliteration:

Original	*Georgian translation*	*Russian translation*
Windows	ვინდოუსი	виндоуз
Bluetooth	ბლუთუზი	блютус
Photoshop	ფოტოშოპი	фотошоп
Processor	პროცესორი	процессор

The third group includes terms translated by loan translation, i.e. by direct translation of a foreign word:

Original	*Georgian translation*	*Russian translation*
Mouse	თაგვი	мышка
Memory	მეხსიერება	память
Keyboard	კლავიატურა	клавиатура
Motherboard	დედა პლატა	материнская плата

Despite the fact that one or another term exists and is established in Georgian, the use of a directly borrowed term from English is more frequent than the Georgian equivalent. In our opinion, this phenomenon is explained by the current trend in Georgian, which is expressed in the influence of a foreign language.

We can see how essentialy important is timely and quality translation in the case of medical translation. The rapid development of medicine is characterized by the discovery and improvement of new drugs and treatment methods, which mainly takes place in the leading countries of the world, from where the latest achievements are spread around the world, in which translation plays a big role.

When translating medical texts, a number of difficulties are encountered, which are mainly related to terminology, equivalence of medical vocabulary. From them, we would like to highlihgt the problem of translation of eponyms. In general, the problem of conveying proper name appears in all fields. Within the framework of the scientific discourse, we were interested in their point of intersection with the terms, which are presented in the form of eponyms.

On the website whonamedit.com, which is a biographical dictionary of medical eponyms, there are currently 8060 eponyms. A medical eponym is any word related to medicine that derives its name from a person.

As a result of the analysis of examples of eponyms common in the medical field, several ways of conveying them were identified:

1. The eponym in the original language was translated as an eponym in Georgian;
2. *e.g. Lyme disease - ლაიმის დაავდება*
3. the eponym in the original language was translated into Georgian as an eponym and a name of a disease;
4. *e.g. Adam's apple - ფარისებრი ხრტილი, „ადამის ვაშლი“*
5. The eponym in the original language was translated into Georgian only as the name of the disease
6. *e.g. Allan-Herndon-Dudley syndrome ფსიქომოტორული ჩამორჩენა (დაქვეითება)*

Due to the difficulties of scientific translation, it can be said that the translator of this type of texts must not only have a good knowledge of the language, but must also possess a special vocabulary in both the source and the target language in order to adequately transfer the given terms to the source language in accordance with the accepted terminological system in this language in order to avoid mistakes , which in many cases can even have serious negative consequences.

3.3. Typology of translation mistakes

To study the scientific discourse, our research went in two directions. For one direction, we have analyzed a sample of quite successful translation of scientific discourse, which at the same time is successfully functioning in the modern Georgian scientific field. We developed and outlined a conditional typology of typical translation mistakes in order to understand what linguistic elements of the source text cause translation mistakes and inaccuracies, and how such inconsistencies can be explained.

For our analysis, we used Ane Håkansson and Thomas Jonter's report on nuclear non-proliferation: "An Introduction to Nuclear Non-Proliferation and Safeguards", which was conducted for the Swedish Nuclear Power Inspectorate (SKI) in 2007 and the Georgian translation of which was prepared in 2018 by a non-governmental organization - Civil Council on Defense and Security Issues.

2 main groups of inaccuracies were identified: insignificant and significant, the causes of which were lexical, grammatical: syntax, morphology and combined.

Insignificant inaccuracies are for example:

Original	Translation	Corrected version
British researchers, who at that time were among the foremost in the world,	ბრიტანელმა მკვლევარებმა, რომლებიც იმ დროისათვის მსოფლიოში გამოჩენილ მეცნიერთა შორის იყვნენ (p.18)	ბრიტანელმა მკვლევარებმა, რომლებიც იმ დროისათვის მსოფლიოში მოწინავე მეცნიერთა შორის იყვნენ

The second group is represented by significant inaccuracies, as a result of which the content was changed. Like the first group, the inaccuracies here were caused by the mismatch of lexical and grammatical units. In lexical inconsistencies, we tentatively identified inaccuracies of vocabulary and terms of general meaning, titles, names of organizations, proper names and other textual level. And in grammatical type mistakes, morphological and syntactic ones were highlighted, but since morphology and syntax are closely related to each other, we often encounter combined type of inaccuracies, to which semantic nuances are added.

In the tables below, we tried to group the aforementioned inaccuracies according to their types.

Lexical inaccuracies of general meaning

Original	Translation	Corrected version
The Additional Protocol and its *consequences*	დამატებითი პროტოკოლი და მისგან გამოწვეული *ქმედებები*- (სარჩევი)	დამატებითი პროტოკოლი და მისგან გამოწვეული *შედეგები*
To begin with, the Soviet Union was skeptical about the *American plans*.	*დასაწყისში* საბჭოთა კავშირი სკეპტიკურად უყურებდა *ამერიკელების გეგმას* (p.24)	*დავიწყოთ იმით, რომ* საბჭოთა კავშირი სკეპტიკურად უყურებდა *ამერიკულ გეგმებს*

Terminological inconsistencies

Original	Translation	Corrected version
Atoms for Peace	მშვიდობიანი ატომი - (სარჩევი)	ატომი მშვიდობისთვის
Cherenkov viewing devices	ჩერენკოვის ნათების აღმწერი მოწყობილობა- (სარჩევი)	ჩერენკოვის ღამის ხედვის ხელსაწყო

Morphological mistakes

Original	Translation	Corrected version
Internal controls as we have never heretofore contemplated.	შიდა კონტროლს, რომელიც აქამდე არ გვქონია (p.21)	შიდა კონტროლს, რომელზეც აქამდე არასდროს დავფიქრებულვართ.

Mistakes of syntactic and combined nature

Original	Translation	Corrected version
the world's major uranium deposit	მსოფლიოს ყველზე დიდ ურანის საბადოზე. (p.20)	მსოფლიოს ურანის ყველზე დიდ საბადოზე
new possibilities for developing and strengthening common international security	საერთაშორისო უსაფრთხოების ახალი ერთობლივი შესაძლებლობების გაჩენას (p.11)	ახალი შესაძლებლობები საერთო საერთაშორისო უსაფრთხოების განვითარებისა და გაძლიერებისათვის

Inaccuracies at the text level, where we have grouped mistakes in headings and subheadings, as well as inaccuracies at the paragraph level:

Original	Translation	Corrected version
An Introduction to Nuclear Non-Proliferation and Safeguards	ბირთვული გაუვრცელებლობა და ბირთვული გარანტიები (სათაური)	შესავალი ბირთვულ გაუვრცელებლობასა და გარანტიებში
The IAEA is formed: the period 1955-57	ატომური ენერგიის საერთაშორისო სააგენტო(p.25)	IAEA შექმნა: პერიოდი 1955-57 წწ

In a separate group, we combined the inconsistencies of organization names and proper names transfer:

Original	Translation	Corrected version
Henri Becquerel	ჰენრი ბეკერელი (p.17)	ანრი ბეკერელი
International Atomic Development Authority (IADA	საერთაშორისო ატომური განვითარების ორგანიზაცია (საგო)– (p. 22)	ატომური განვითარების საერთაშორისო ორგანიზაცია
International Atomic Energy Agency	საერთაშორისო ატომური ენერგიის სააგენტო. (p. 25)	ატომური ენერგიის საერთაშორისო სააგენტო

Based on the analysis of the given examples, it can be concluded that the errors are caused by different reasons. Lexical inaccuracies are often caused by using the wrong equivalent in the target language. The incorrect translation of the terms is probably caused by the fact that they were not checked in the appropriate terminology system or with a field specialist.

Inaccuracies of the morphological type depend on the different morphological capabilities of the Georgian and English languages. For example, in English, aspect is expressed by the tense

forms of the verb. Similar nuances are conveyed in a different way in the Georgian language, so it is not surprising that there are similar errors in the translation.

As for the inaccuracies made at the syntactic level, this is explained by the fact that the structure of various languages is very different, including English and Georgian languages. The sentences order does not match: they have a different order of members, which is sometimes free, and sometimes compulsory, the wide possibilities of the Georgian verb change the structure of the sentence in the case of translation, and so on.

Based on the above, the following recommendations were developed:

Recommendations

In the second direction of our research, as a result of the analysis of typical mistakes, various translation methods were identified, on the basis of which we tried to develop the most successful translation strategies in order to achieve the most adequate translation. Based on this, we would like to offer recommendations that any translator working in this field should consider.

1. First of all, we would like to draw attention to the subject of a long debate in this field and answer the question: who is a better translator - a professional translator or a specialist in the field? While working within the framework of the above-mentioned international scientific project, we met and interviewed a number of recipients, among whom we would like to single out one of them, who works in the medical field and spoke a foreign language at an elementary level. In the course of his activity, the mentioned recipient often faced a problem when such gross mistakes were made in the translation of foreign medical documentation, that ultimately led to quite significant content inaccuracies. He had to correct these mistakes, as a result, he improved his level of foreign language skills and began to translate medical documents himself, and quite successfully. Because, in this case, we got a synthesis of a foreign language expert and a field specialist. This is a rare case, when special professional education is combined with the experience of a professional translator.

2. Since such a precedent is rare, especially in the Georgian-English language relationship, our first recommendation can be formulated as follows: in the scientific field, the most effective is the so-called mixed translation, the same as authorized, which means that the translation is done by a professional translator, but the final editing is done by a professional translator and the author - a specialist in the field, because only when perceiving the complete target text can the field specialist check for mistakes.

3. The second recommendation is related to the systemic requirement, which, in general, is important for the translation of any field of study, but in our opinion, the scientific discourse needs a special requirement of the systemic approach, because the content of a single term depends on the other terms included in this terminological system, their relationship with each other. That is, the exact match of the term is found only as a result of unfolding the complete paradigm.
4. Along with this, we should remember that in many scientific fields, in addition to the terms themselves, so called professionalisms are used, which are usual words and expressions, but have acquired additional connotations in a particular professional field. The functional aspect is so essential that if a specific term has any additional connotations during its functioning, it may be understood only by a narrow specialist, while it may be lost with the translator. That is why it is very important to have a systemic approach and to understand the peculiarities of the term's functioning.
5. We also believe that special attention should be paid to the general factors causing translation mistakes in the translation of scientific discourse, such as inconsistencies of the lexical units of the source and target languages, grammatical categories, linguistic norms, etc.. This problem appears more or less in the translation of all discourses. But if a minor inaccuracy does not create a problem in the translation of a literary or publicistic text, as our analysis has shown, a small inaccuracy in scientific discourse can easily grow into a big problem.
6. It is also very important to consider the dynamics of scientific development. This means that the same term may function in different ways at different stages of the development of this or that field of science, and accordingly, the term may change. Attention should be paid to whether this change is recorded in the translation. For example, we can analyze

the following term from our research material: ***nuclear***, which in English means both: atomic and nuclear, while in Goergian and Russian it corresponds to two different lexical units, which functioned at various historical stages. Accordingly, when it comes to the first generation of the nuclear weapon, the term "atomic" is used, while for the next generation, more advanced one the term "nuclear" is applied.

7. And our last recommendation is intended not only for translators, but also for all interested parties (field specialists, linguists, translators). For the professional translation of scientific discourse, it is necessary to prepare a lot of auxiliary literature, which, unfortunately, is very scarce in the Georgian-English language field (we mean specialized dictionaries, such as: general scientific clichés, phrasearium, narrow special terminological dictionary, dictionary of abbreviations, etc.).

8. Translation of scientific texts cannot fulfill its purpose without adequate translation of terms. It is necessary to meet a number of conditions to achieve this. Extensive experience in scientific-practical translation allows us to name three main stages of adequate translation of terms. First, finding the equivalent of the separate terms in the target language or the corresponding transformation must be performed. The second condition is that each translated term must be checked in terms of the terminology of the source language and the target language. And thirdly, the difference in terms should be taken into account, which is due to the specifics of the transfer of thought in one or another language.

Conclusion

As a result of the conducted research, the following conclusions were made:

1. The coverage of translation activity since ancient times shows the great role that translation played in the development of Georgian and world science in general, despite the fact that there was no theoretical science until the 17th century and translation studies was formed in the second half of the 20th century.
2. The history of the world translation activity and its peculiar functioning in Georgia shows that these peculiarities were formed under the influence of numerous geo-political and

socio-cultural factors, therefore the periodization developed by us (together with the scientific supervisor M. Aroshidze) is based on the change of translation focus in different historical periods of development of Georgia.

3. In the twenty-first century, against the background of the fastest development of science and technology, the demand for Western or American scientific works has increased, naturally, the intensity of Georgian translation has grown, including in the scientific field. Nowadays, the problem of the quality of scientific translation is quite acute, which is caused by various factors.
4. The study of the features of scientific discourse revealed that it is a variety of institutional discourse, represented by different directions. Scientific discourse includes a number of principles through which knowledge is created, interpreted and transmitted.
5. Scientific discourse is also characterized by a peculiar language, which may have a general scientific or narrowly specialized character: vocabulary, grammatical constructions, clichéd phrases, a peculiar syntactic arrangement. Scientific discourse is also characterized by a peculiar style.
6. Scientific terms are the biggest difficulty in translation. Therefore, the focus of our research was on translation problems of scientific terms. First of all, we reviewed the most common translation methods for transcoding scientific discourse.
7. Based on the typology of translation errors conducted by us, we have developed recommendations that should be guided by a translator in this field.

The main provisions of the dissertation work were reflected in the following publications:

1. "International scientific conferences as ways of knowledge exchange" - Balkanistic forum" journal, 1/ 2021/ ISSN 1310-3970 (Print), ISSN 2535-1265 (Online) / (to be published)

2. "Translation and translation studies in Georgia"- Georgian National Academy of Sciences Adjara Autonomous Republic Regional Scientific Center, Transactions VII/ Batumi,2021. / ISSN 2449-2507/ 83.159-166

3. IT Translation - International Scientific Conference MATHEMATICAL MODELING, OPTIMIZATION AND INFORMATION TECHNOLOGIES 7th edition 15 - 19 November 2021(MMOTI-2021)/Chişinău –Kiev –Batumi/ http://new.incyb.kiev.ua/podrzdeleniya/viddilennya-matematichnoi-kibernetiki-ta-

sistemnogo-analizu/viddil-metodiv-negladkoyi-optimizaciyi/konferenciya-mmoti-2021?show=1/ ISBN 978-9975-159-03-6 CZU 519.711:004(082)=00 M 84 , p. 96-101

4. Problems of teaching translation of scientific-technical discourse-SOCIO-EDUCATIONAL INNOVATIONS IN EDUCATION, International Scientific and Practical Conference/ March 15-16, 2022/ Collection of articles/Armenia, Ijevan – 2022/ISBN 978-9939-1-1442-2, გვ.293-297

5. Translation of Medical Discourse- Georgian National Academy of Sciences Adjara Autonomous Republic Regional Scientific Center, Transactions VIII, Batumi 2022, ISSN 2449-2507 (to be published)

6. Development of science and the role of translation in the process of knowledge dissemination- " Herald of Oriental studies " Volume V, Part 2. (to be published)