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EFFECT OF FOOD ADDITIVES ON HUMAN HEALTH

Ahmadova L.B.,
Teacher,
Mingachevir State University
Mustafayeva V.S.
PhD in Biology,
Senior Lecturer, Department of Physics and Ecology
Mingachevir State University
DOI: https://doi.org/10.5281/zenodo.7541058

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ВЛИЯНИЕ ПИЩЕВЫХ ДОБАВОК НА ЗДОРОВЬЕ ЧЕЛОВЕКА

Ахмедова Л.Б.
Преподаватель,
Мингячевирский Государственный Университет
Мустафаева В.С.
Доктор философии по биологии,
Старший преподаватель кафедры физики и экологии
Мингячевирский Государственный Университет

Abstract

Nutrition is one of the most important needs for a person to manage his life. Today, with the increase in the production of manufactured and packaged foods, the use of food additives has become widespread. The purpose of adding these substances to foods is to prevent spoilage of foods, to extend the shelf life, as well as to preserve the qualitative characteristics of the natural color and aroma of foods, and to increase the assortment of foods. Due to the increased consumption of chemicals, we exclude ourselves from natural products when feeding with ready-made meals, which we use without even hesitation due to the small volume, easily edible, but also having an attractive appearance, which leads to an increase in the Daily permissible dose. The aim of this study is to analyze the many effects that protective food supplements have on human health despite being used in predetermined amounts.

Аннотация

Питание-одна из важнейших потребностей человека, чтобы он мог управлять своей жизнью. Сегодня, с увеличением производства полуфабрикатов и расфасованных пищевых продуктов, широкое распространение получило использование пищевых добавок. Целью добавления этих веществ в продукты питания является предотвращение порчи продуктов, продление срока их хранения, а также сохранение качественных характеристик естественного цвета и аромата продуктов и увеличение ассортимента продуктов. Из-за повышенного потребления химикатов, небольшого объема, легко съедобного, а также из-за наличия привлекательного внешнего вида, мы без колебаний отказываемся от натуральных продуктов при кормлении готовыми к употреблению блюдами, что приводит к увеличению суточной допустимой дозы. Цель этого исследования-проанализировать многие эффекты, которые защитные пищевые добавки оказывают на здоровье человека, даже если они используются в заранее определенных количествах.

Keywords: food additives, health, food, pickle, roast
Ключевые слова: пищевые добавки, здоровье, еда, солить, жаркое

Since ancient times, people have developed various methods for keeping food longer without spoiling. They tried to preserve food by salting, vinegar and burnt sulfur. Salt and sugar, the oldest food preservatives, were used to preserve food by reducing water activity to the point where microorganisms could not grow. In the Middle Ages, the purpose of adding nitrate to meat was to prevent botulism (food poisoning). At this time, it was found that he looked healthier and more alive. The Huns have achieved this by using sausages and roasting to preserve meat. The use of food supplements began to increase after the XVIII century. These substances are used in addition to many products, such as to prevent food from spoiling or to increase its taste and color.

Food additives are chemicals however, substances such as fats, carbohydrates and minerals that are found in foods and are essential for life are also chemical substances. Six hundred twenty-five chemicals were found in coffee, four hundred seventy-five in wine, three hundred twenty-five in bananas, three hundred and fifty in tomatoes, and two hundred and fifty in orange juice [1].

While in the past several thousand natural chemicals were used in all fields, today eighty thousand

chemicals are used for various purposes and this number is increasing. In 1950, the production of chemical substances in the world was seven million tons/year, but now this figure has reached four hundred million tons/year [2].

Depending on the type of food, one or more food additives can be used at the same time. Additives are added to prevent changes in the chemical composition of food, to prevent microbial growth or spoilage.

The rapid development of the food industry has led to an increase in the use of food additives. The properties of food additives and the level of their amounts in the foods in which they are used are investigated and given importance internationally [2].

Although the use of dietary supplements is permitted, they can have toxic effects on the body when consumed continuously and in high amounts [1]. The additives used must have properties that do not affect human health. Each country regulates the foods it can add and the ratio of food additives according to its conditions.

Food additives that enhance the aroma and color of food. Flavoring additives are used to increase the taste or smell of food, to make it more attractive. The most commonly used flavoring agent is monosodium glutamate. It can cause Chinese restaurant syndrome [7]. Ingestion of monosodium glutamate may result in chest pain, facial flushing, flushing, sweating, dizziness, headache, palpitations, nausea, and vomiting. In children, it can be observed with chills and shivering, nervousness, screaming. Apparently 15-20% of the general population is sensitive to small doses of monosodium glutamate. Symptoms begin within an hour of ingestion, but may last up to 14 hours [3]. Colorants are added to food in order to restore the natural color lost during product processing and storage, to give color to colorless food, to strengthen weak color, and to win the favor of the consumer by hiding its poor quality. It is used in many products such as soft drinks, ice creams, candies, powdered drinks, waffles, cookies, creams, chewing gums [7].

The use of food supplements and their impact on health. Despite the benefits of food supplements, consumers are of the opinion that these substances are harmful to health. The reason why the consumer thinks so is the masking of poor-quality or spoiled foods, improper processing of food, preparation of imitated Foods, lowering the nutritional value of the product, using it in excess of the norm to achieve the desired effect, non-observance of processing and packaging techniques [7].

Cancer-causing nitrosamines produce nitrites and nitrates, used as preservatives, which reduce the oxygen-carrying capacity of the blood. Some researchers have begun to investigate methods of reducing nitrite residues and nitrosamine formation in the final product, as meat products produced without nitrites will have a reduced shelf life, tasteless and bad color, thus causing health problems through food poisoning.

Another study tested blue, green, red, yellow and orange food colorings used in baby food. As a result of the study, it was determined that food dyes caused hyperactivity in rats in the first month of birth [5]. The same researcher suggests that children with attention-deficit hyperactivity disorder have significant improvements when artificial colors are removed from their diet. Another piece of evidence that artificial additives cause behavioral problems is that xanthan-type dyes alter the physiological properties of neurons in invertebrates.

In patients with natriummetabisulfite asthma, asthma attacks cause mutations in thiamine-destroying bacteria. It is added to cookies, waffles, cakes, potato chips and vinegar.

Benzoic acid causes hangovers, skin rashes, migraines. It is added to margarine, olive paste, soft drinks, jam, biscuits, cookies, waffles, cake juices, sauces and ketchups.

It is known that phenolic substances naturally present in the roots of some plants are anticarcinogenic. However, synthetic phenols used as antioxidants also have effects as co-carcinogens, causing precancerous lesions, papillomas, and cancer [6].

The increase in the use of nutritional supplements to increase sales also brings with it many dangers. In countries where there is no necessary control, the allergic, carcinogenic, mutagenic and teratogenic effects of food additives on human health are not taken into account. The most important factor that food additives will negatively affect human health is the use of these substances in excess of the permissible doses or their non-compliance with the purity of food.

In order to eliminate or minimize the health effects of food supplements, some nuances should be taken into account. When buying a food product, the consumer should pay attention to its shelf life and composition. Goods whose address and quality of production are unknown should not be used because they are on sale at low prices corresponding to the budget. The use of food additives that should be used in production in excess of the recommended amount should be prevented by educating food producers.

It is impossible to completely isolate food supplements from the composition of the foods we use. The important point is to minimize the dangers by ensuring the use of these substances in the way and in quantities established by the laws.

References

1. Briggs, D. R. (1997). Food Additivis. Wahlgvist, M. L. (Ed.). Food and Nutrition. Allen & Unwin Pty Ltd.

2. Karakaya E. Gıda Katkı Maddeleri ve Gıda Kontaminantları, 2010.

3. Koçak KA. Anaflaksi tedavisi, 2010.

4. Kotsonis FN, Burdock GA, Flamm WG. Food Toxicology .In: Chapter 30 , Unit 7 Applications of Toxicology. 2001. p.1049-1088.

5. Shaywitz B. Food colorings given following birth generate attention deficit disorder symptoms. Neurobehavioral Toxicology. 1997;Vol.1: 41-47.

6. Sitich, F. H. "The beneficial and hazardous effects of simple phenolic compounds", Mutation Research, v:259, s:307-32, (1991).

7. Yurttagün M. Gıda Katkı maddeleriyle ilgili geniş kapsamlı bir araştırma, 2010.

EARTH SCIENCES

ANALYSIS OF THE STATE OF THE ZHANASEMEYSKY FORESTRY "SEMEY ORMANY"

Shogelova N.,
Master of Technical Sciences,
International Educational Corporation,
Assistant Professor (Kazakhstan, Almaty)
Sartin S.,
Candidate of Physical and Mathematical Sciences,
North Kazakhstan University named after Manash Kozybayev,
Associate Professor (Kazakhstan, Petropavlovsk)
Omirzhanova Z.
Candidate of Technical Sciences,
International Educational Corporation,
Associate Professor (Kazakhstan, Almaty)
DOI: https://doi.org/10.5281/zenodo.7541071

Abstract

Currently, the situation around forest management is unfavorable for the preservation of the total mass of forests. In general, there are often facts without control logging, incomplete restoration of forests, lack of operational information about the state of individual forest fund allotments and many smaller problems. In the development strategy of our country "Kazakhstan - 2050", the new political course of the established state highlights the process of digitalization of society. During the implementation of the project, it is planned to use GIS technology for the transition to full digitalization of forestry activities on the example of the Zhanasemeysky forestry "Semey Ormany". This will significantly reduce the influence of the human factor on the planning of the logging process and the restoration of forests.

Keywords: forest management, remote sensing of the earth, forest.

Currently, the situation around forest management is unfavorable for the preservation of the total mass of forests. In general, there are often facts without control logging, incomplete restoration of forests, lack of operational information about the state of individual forest fund allotments and a large number of smaller problems.

This situation may soon lead to a catastrophic ecological situation associated with the desertification of lands previously covered with forest. As well as the extremely unfavorable economic situation associated with the lack of a reserve forest fund for timber harvesting.

According to the satellite survey data, only during the period from 1995 to 2002, fires in the forests of the Irtysh region destroyed 162 thousand hectares of pine forests, which is 34% of their area. From 1997 to 2001, pine trees on an area of 17,988 hectares were killed by fire in only one of the nine forest districts [1].

Since the establishment of the state forest natural reserve "Semey Ormany" for the period 2003 – 2013, 735 violators have been brought to administrative responsibility for illegal logging, with fines in the amount of 10 million 305 thousand tenge, 89 criminal cases have been initiated, 688 violators have been charged with damage in the amount of 56 million 590 thousand tenge. tenge. For the period from 2017 to 2019, 382 offenses were registered, 15 facts of illegal logging were revealed. In 2021, 49 facts of illegal felling of trees and shrubs were revealed, for which 6 pre-trial investigations were launched and 43 violators were brought to administrative responsibility [2].

A similar situation is observed in many regions of the Republic of Kazakhstan, where active forest management is carried out [3].

An analysis of existing and implemented state programs for planting and restoring forests indicates the need to create electronic vector maps using free software applications and develop a model of effective forest management.

In the development strategy of our country "Kazakhstan - 2050", the new political course of the established state highlights the process of digitalization of society [4]. Rational nature management implies the optimal solution of environmental problems facing the territory, which arise as a result of various economic measures that have a direct or indirect impact on the environment. Usually, such impacts are destructive to the vegetation of the developed territory and contribute to anthropogenic dynamic processes. In some cases (for example, various types of forest management and agriculture) this is due to the direct use of plant resources: forest resources (wood, pine nuts, wild flora, etc.), steppe and meadow resources (hayfields and pastures), etc. In other cases, vegetation is affected by man-made and household emissions from industrial enterprises and residential areas. In addition, it is affected by the pyrogenic factor associated with targeted (man-made) burnout, usually used in traditional land use, or non-targeted forest and steppe fires. They are usually of anthropogenic origin and are caused by human activities: tourism, outdoor recreation, accidental use of plant resources, etc. [5].

One of the main tasks facing the forest nature reserve is the preservation of the ribbon pine forests

protected within its borders, which play an environment-forming role in the East Kazakhstan Irtysh region. The state of forest ecosystems is affected by fires, pests and diseases of the forest, poaching and logging.

Zhanasemeiskoye forestry is located on the territories of the GLPR "Semey Ormany" and has an area of 77,746 hectares. Protection of forests from unauthorized logging and hunting on the territory of the forestry is carried out by the forces of the service for the protection of natural complexes and objects, as well as by state inspectors directly on the territory of the reserve. The entire area is divided into blocks, the average area of which is 100 hectares. State inspectors are assigned to the blocks, who constantly monitor their condition. Round-the-clock surveillance is conducted at checkpoints. The territory of the reserve is periodically patrolled by operational groups.

Figure 1 shows a part of the schematic map reflecting the spatial location of the taxable allotments, the qualitative structure of the lands and plantings of the forest fund of the forestry. It was created on the forestry plan by coloring the taxable allotments of the lands covered with forest vegetation according to the prevailing breeds and age groups. Other categories of forest fund lands are represented by conventional signs.

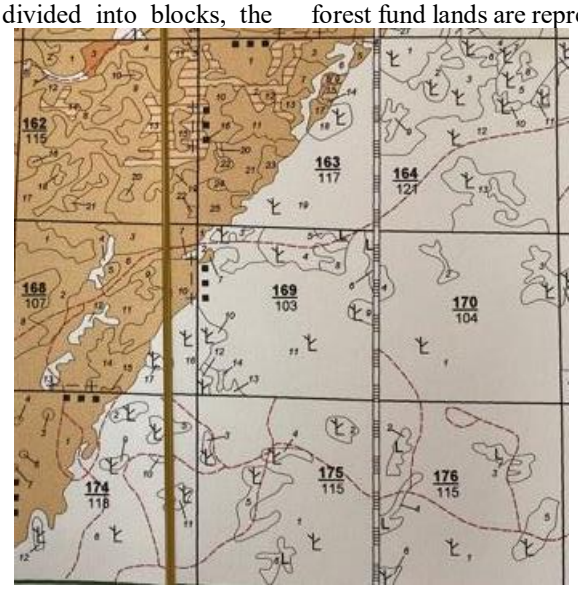

Fig.1 – Blocks on the map of Zhanasemeysky forestry

The implementation of forest monitoring requires the involvement of a wide range of means of obtaining information, an important place is given to space remote sensing systems. Quantitative and qualitative characteristics of forests continuously change during the natural development of biogeocenoses and under the influence of various anthropogenic and natural factors: its composition changes, borders migrate.

The degradation of forests is particularly dangerous in terms of quality, since in many cases low-value deserts or clearings arise in the areas of harems formed as a result of fires and subsequently cleared of burnt forest. This problem is the most urgent for the Abad region, since forests here play a leading role in protecting the territory from dust storms, slowing down the processes of erosion and deflation. In addition, the ribbon forests stretching across the entire territory of the Abai region are relict, as they grow on the sandy sediments of the ancient runoff valley, where the processes of desertification and prevailing winds led to the formation of Aeolian landforms (dunes), which are very well deciphered inside forests in satellite images due to the characteristic wavy structure and crescent shape.

The study is to assess the possibility of identifying and mapping the consequences of large forest fires with the calculation of their parameters based on remote sensing materials. Solving this problem by other means (ground and aerial) is associated with significant costs for obtaining the necessary data. Space information makes it possible to quickly solve environmental and environmental problems.

According to the satellite survey data, only during the period from 1995 to 2002, fires in the forests of the Irtysh region destroyed 162 thousand hectares of pine forests, which is 34% of their area. From 1997 to 2001, pine trees on an area of 17,988 hectares were killed by fire in only one of the nine forest districts.

The volume of illegally cut down trees for the period 2010-2012 and for the first half of 2013 amounted to 2.7 thousand cubic meters, damage was caused in 17.2 million tenge, of which only 2.6 million were reimbursed. Only during the inspection by the prosecutor's office, 15 facts of illegal logging of 1,153 pine trees with a total volume of more than 150 cubic meters with damage amounting to 1 million 664 thousand 407 tenge were revealed. In 2013, 10 cases of illegal logging were detected, with a total volume of 239 cubic meters of felled wood, with the amount of damage of 1 million 811 thousand tenge. For the period from 2017 to 2019, 382 offenses were registered, 15 facts of illegal logging were revealed. In 2021, 49 facts of illegal felling of trees and shrubs were revealed, for which 6 pre-trial investigations were launched and 43 violators were brought to administrative responsibility.

References

1. Otchet o deyatel'nosti RGU «GLPR «Semej ormany» za 2021 god. – Semej 2022. http://semey-ormany.kz

2. Sajt media portala Azattyқ ruhy [Elektronnyj resurs]. – Astana; 2022. . – Rezhim dostupa : rus.azattyq-ruhy.kz, svobodnyj.

3. Ajnabekov M.S. Sovremennoe sostoyanie lesnogo hozyajstva Respubliki Kazahstan // Materialy Mezhdunarodnoj nauchno-prakticheskoj konferencii «Lesnaya nauka Kazahstana: dostizheniya, problemy i perspektivy razvitiya», posvyashchennoj 60-letiyu sozdaniya KazNIILHA. – SHCHuchinsk., 2017. – S.13-25. http://kazniilha.kz/public/files/2019/9/12/120919_183414_schuchinsk-2017.pdf

4. Strategiya «Kazahstan-2050»: novyj politicheskij kurs sostoyavshegosya gosudarstva, Poslanie Prezidenta Respubliki Kazahstan – Lidera Nacii N.A. Nazarbaeva narodu Kazahstana. - Astana, 2012, dekabr' -14.

5. Shogelova, N., Sartin, S., Zveryachenko, T. (2022). Devising recommendations based on a comprehensive assessment of the soil-geobotanical condition of land plots for executing afforestation activities. Eastern-European Journal of Enterprise Technologies, 2 (10 (116)), 30–41. doi: https://doi.org/10.15587/1729-4061.2022.255054

JURISPRUDENCE

HISTORICAL ANALYSIS OF THE RELATIONS WITH THE ECHR

Gaivoronskaya L.V.
Candidate of Legal Sciences
Senior Lecturer of the Department of Criminal Procedure Law
Kutafin Moscow State Law University
Moscow, Sadovaya-Kudrinskaya str., 9, p.1
DOI: https://doi.org/10.5281/zenodo.7541078

ИСТОРИЧЕСКИЙ АНАЛИЗ ВЗАИМООТНОШЕНИЙ С ЕСПЧ

Гайворонская Л.В.
кандидат юридических наук,
старший преподаватель кафедры уголовно-процессуального права
МГЮА им. О.Е. Кутафина
Москва, ул. Садовая-Кудринская, д.9, с.1

Abstract
The author analyzes the relations of a number of participating countries with the European Court of Human Rights, and mainly with the Russian Federation throughout their historical cooperation: development, formation, emergence of confrontation and termination of relations.

Аннотация
Автором проанализированы отношения ряда стран-участниц с Европейским судом по правам человека, и главным образом с Российской Федерацией на протяжении всего их исторического сотрудничества: развития, становления, появления противоборства и прекращения отношений.

Keywords: European Convention on Human Rights; relations between the Russian Federation and the ECHR; historical analysis of relations with the ECHR.
Ключевые слова: Европейская конвенция по правам человека; взаимоотношения РФ и ЕСПЧ; исторический анализ взаимоотношений с ЕСПЧ.

16 марта 2022 года Комитет Министров Совета Европы проголосовал за прекращение членства России в Совете Европы. 7 июня 2022 года Государственная Дума приняла законы о неисполнении решений ЕСПЧ, вступивших в силу после 15 марта 2022 года. В тот же день законы утвердили в Совете Федерации. 16 сентября 2022 года Россия перестала быть стороной Европейской Конвенции по правам человека, а на нарушения, совершенные после этой даты, пожаловаться в ЕСПЧ будет нельзя[1].

На сегодняшний день отношения ЕСПЧ и Российской Федерации завершены, вопрос в том, спешное ли это решение двух сторон или последовательное завершение, к которому стороны шли последние десятилетия? В данной статье автору хотелось бы поразмышлять на тему исторического развития отношений ЕСПЧ и России на протяжении всего их симбиотического существования.

Проблема взаимоотношений Европейского Суда по правам человека и национальных судов стран – участников Конвенции – это вопрос не сегодняшнего дня, месяца или года. Нарастающие недопонимание и стратегическое противостояние со стороны высших судов существовало не только между Европейским Судом и Российской Федерацией. Такие прецеденты были. Великобритания (Осман (Абу Катада) против Соединенного Королевства; Херст против Соединенного Королевства). Германия (Гергюлю против Германии). Испания (Инес дель Рио Прада)

Дело Херст против Соединенного Королевства было одним из первых решений, которое получило острую негативную оценку у британского сообщества, а интерпретации Конвенции по правам человека Европейским Судом встали под сомнение.

Европейский Суд обязал Великобританию пересмотреть национальное законодательство и предоставить право голосования заключенным. На тот момент министр внутренних дел Тереза Мэй призывала рассмотреть все возможности, включая выход страны из Европейской конвенции, чтобы препятствовать «безумной интерпретации законов о правах человека». Перед Великобританией впервые встал вопрос возможности исполнения или неисполнения решения международного суда[2].

К 2010 году в Европейском Суде скопилось 2500 жалоб от британских заключенных на нарушение их избирательных прав. Тогда Европейский

[1] Подача жалоб в ЕСПЧ и исполнение его решений после исключения России из Совета Европы// https://ilpp.ru/echr_denunciation

[2] Лакеева Е. «За что критикуют ЕСПЧ в разных странах» 14.01.2014г.//https://pravo.ru/review/view/100539/

Суд по правам человека принял «пилотное постановление» в деле «Гринс и М.Т. против Соединенного Королевства», не только присудив возмещение заявителям по делу судебных расходов, но и потребовав от Великобритании в шестимесячный срок подготовить проект изменений в законодательство, а само новое законодательство принять в установленный Комитетом министров Совета Европы срок.

Именно в тот момент стали высказываться мнения о чрезмерно широком толковании Конвенции, о важности сохранения суверенитета государства и его усмотрения в зависимости от национальных особенностей.

Судья Апелляционного суда Джон Лос поставил вопрос о необходимости разработки собственного механизма управления и перестать уповать на ЕСПЧ, поскольку при одних и тех же фактических обстоятельствах в разных странах могут быть разные правильные решения одинаковых проблем[3].

Судьей Верховного суда Великобритании Джонатаном Сампшеном было справедливо подмечено, что Европейский суд стал применять слишком творческую интерпретацию Конвенции о правах человека. Особенно ярко это прослеживалось на примере статьи 8 Конвенции о праве на частную и семейную жизнь, когда интерпретации в большинстве случаев не могли быть даже выведены из подтекста: «Право, которое изначально было призвано дать защиту от внутригосударственной слежки тоталитарных правительств, теперь расширилось настолько, что стало касаться правового статуса незаконнорожденных детей, иммиграции и депортации, экстрадиции, аспектов уголовного наказания, абортов, гомосексуализма … и многого другого»[4].

К 2017 году Верховный суд Великобритании сформулировал условия, при которых можно не исполнять решение ЕСПЧ, вынесенное в отношении Великобритании:

- Когда есть основание предполагать, что ЕСПЧ в ближайшем будущем будет того же мнения, что и британский суд;
- Суду следует придавать большее значение позиции законодателя, который определил баланс прав и интересов иначе, чем ЕСПЧ;
- Позиция ЕСПЧ по правам человека является явно устаревшей;
- Решение ЕСПЧ надо принимать во внимание, но следовать им только, если они не противоречат основополагающим материальным и процессуальным нормам национального права[5].

С 1 января 2021 года Великобритания завершила процесс выхода из Европейского Союза, который начался в конце января 2020 года. Премьер-министр Великобритании Борис Джонсон заявил, что с января 2021 года Великобритания обретает полную политическую и экономическую независимость. Больше Великобритания не подчиняемся правилам ЕС, Европейский суд не играет никакой роли, и все наши ключевые красные линии в отношении возвращения суверенитета были достигнуты[6].

В отличие от многих других Европейских стран, Германия отказалась от принятия концепции верховенства международного права. В Конституции Германии записано, что единым и высшем источником права в стране является Конституция Германии. Наряду с этим международные акты, ратифицированные Германией, имеют силу обыкновенного закона. Следовательно, Федеративная Республика Германия в национальном праве страны закрепила правовую возможность не исполнять часть решений Европейского суда по правам человека.

Федеральный Конституционный суд Германии в деле «Гергулю против Германии» поставил Конституцию Германии выше, чем Европейскую конвенцию: указал немецким судам принимать во внимание это решение Европейского Суда, не нарушая Конституции Германии. В итоге решение Европейского Суда по правам человека по делу «Гергулю против Германии» было исполнено, что в 2009 году констатировал Комитет министров Совета Европы. Однако стоит отметить, что, обозначив приоритет Основного закона перед решениями Европейского Суда в качестве теоретического принципа, Федеральный Конституционный суд Германии далее со ссылкой именно на верховенство конституции разрешил конфликт в соответствии с позицией Европейского Суда.

В Италии противоречия между Конституцией и решениями Европейского Суда возникали дважды: дело «Скордино против Италии» (право государства присваивать собственность человека без покупки), «Маджо и другие против Италии» (трансграничные пенсионные выплаты). Однако Конституционный суд Италии признал неконституционность тех национальных законов, которые привели к нарушениям, выявленным Европейским Судом и постановил привести их в соответствие с той интерпретацией, которую дал Европейский Суд. Таким образом, также как и в случае с Германией, Италия не захотела переходить на конфликт с ЕСПЧ и полностью исправила нарушения.

«Дело Тэнасе против Молдовы» стало основой для разногласий между Конституционным судом Молдавии и Европейским Судом. По этому делу Европейским Суд 18 ноября 2008 года установил, что, запрещая лицам с двойным гражданством избираться депутатами, молдавский законодатель нарушил право на свободные выборы. 26 мая 2009 года Конституционный суд Молдавии своим решением фактически отказался признать обязатель-

[3] 5 британских поводов отказаться от ЕСПЧ// https://pravo.ru/review/view/117334/

[4] Лакеева Е. «За что критикуют ЕСПЧ в разных странах» 14.01.2014г.// https://pravo.ru/review/view/100539/

[5] Свои правила - Как Верховный суд Британии поможет Конституционному суду России "одолеть" ЕСПЧ// https://pravo.ru/review/face/view/126068/

[6] Великобритания завершила процесс Brexit и покинула Евросоюз// https://www.interfax.ru/world/743826

ность этого решения. Большая палата Европейского Суда в решении от 27 апреля 2010 года подтвердила, что в данном случае было нарушено право на свободные выборы. В том же 2010 году парламент Молдавии отменил этот закон. Таким образом решение Европейского Суда было исполнено.

Дело «Константин Маркин против Российской Федерации» ... Дело «Анчугов и Гладков против Российской Федерации» ... Дело «ОАО нефтяная компания «Юкос» против Российской Федерации» ... Дело «Федотова и другие против Российской Федерации» … Список спорных и противоречивых решений в отношении Российской Федерации постепенно растет, отношения из взаимодействия и сотрудничества начинают сменяться на соперничество. Причинами нарастающего противостояния Европейского Суда и Конституционного Суда Российской Федерации является желание последнего сохранить суверенитет государства и возникающими спорами о превышении своих полномочий Европейским судом по правам человека.

После ряда прецедентов Конституционным Судом Российской Федерации был принят Федеральный конституционный закон от 14.12.2015г. № 7-ФКЗ «О внесении изменений в Федеральный конституционный закон «О Конституционном Суде РФ», закрепивший право Конституционного Суда РФ разрешать вопрос о возможности исполнения решения Европейского Суда по правам человека. Так, исполнение решений Европейского Суда можно было признать невозможным, если оно противоречит Конституции Российской Федерации. Россия стала в порядке исключения отступить от выполнения возлагаемых на нее обязательств, когда такое отступление было единственно возможным способом избежать нарушения основополагающих принципов и норм Конституции Российской Федерации.

Конституционный Суд Российской Федерации пояснил, что международный договор является для его участников обязательным в том значении, которое может быть уяснено с помощью приведенного правила толкования. С этой точки зрения если Европейский Суд по правам человека, толкуя в процессе рассмотрения дела какое-либо положение Конвенции о защите прав человека и основных свобод, придает используемому в нем понятию другое, нежели его обычное, значение либо осуществляет толкование вопреки объекту и целям Конвенции, то государство, в отношении которого вынесено постановление по данному делу, вправе отказаться от его исполнения, как выходящего за пределы обязательств, добровольно принятых на себя этим государством при ратификации Конвенции. Соответственно, постановление Европейского Суда по правам человека не может считаться обязательным для исполнения, если в результате толкования конкретного положения Конвенции о защите прав человека и основных свобод, на котором основано данное постановление, осуществленного в нарушение общего правила толкования договоров, смысл этого положения разойдется с императивными нормами общего международного права, к числу которых, безусловно, относятся принцип суверенного равенства и уважения прав, присущих суверенитету, а также принцип невмешательства во внутренние дела государств.

Группой экспертов Совета Европы в области конституционного права, а именно Венецианской комиссией, было вынесено впоследствии заключение, где подчеркивалось, что государства-участники не имеют выбора между исполнением или неисполнением постановлений Европейского Суда. На усмотрение государств может быть оставлен лишь порядок и способ исполнения решений Европейского Суда по правам человека. Поэтому в части возможности исполнения решений ЕСПЧ поправки в Федеральный конституционный закон «О Конституционном Суде РФ» не совместимы с международными обязательствами России. Такие полномочия могут воспрепятствовать исполнению международных решений в той или иной форме. По мнению комиссии, если Конституционный Суд Российской Федерации не способен разрешить коллизию между Конституцией и решением международного органа, то это не освобождало Российскую Федерацию от обязанности исполнить его. Даже если такое исполнение требует внесения изменений в Конституцию, это сделать необходимо. Вместе с тем, комиссия согласна, что исполнение международного решения может иметь альтернативную форму.

Стоит отметить, что национальные власти порой не исполняли решения Европейского Суда по правам человека, не делая об этом специальных заявлений. В свою очередь Европейский Суд мог принять меры против такого рода неисполнения - например, начать начислять неустойку за задержку выплаты присужденной заявителю компенсации. Последствиями невыполнения постановлений Европейского суда могло быть и приостановление членства или исключение из членов Совета Европы. Есть страны Совета Европы, которые не исполнили подавляющее большинство принятых против них постановлений Европейского Суда по правам человека. Например, по состоянию на сентябрь 2018 года Азербайджан из принятых против него 203 постановлений исполнил только 3 (1,5 %), Россия из принятых против неё 2380 постановлений Европейского Суда исполнила только 608 (25,5 %).

Все это вновь и вновь заставляет задуматься над причинами неисполнения решений Европейского Суда, проблемах толкования конкретного решения, в нарастающем сопротивлении, а не взаимовыгодном сотрудничестве Европейского Суда и национальных судов стран-участниц, которое продолжалось многие годы.

Судья Конституционного Суда Российской Федерации Князев С.Д. подмечал, что ЕСПЧ «нередко фактически подменяет интерпретацию положений Конвенции самостоятельным выведением общеевропейских стандартов на основе превалирующих (преобладающих) национальных практик… едва ли уяснение существа конвенционных гаран-

тий может иметь своим основанием арифметическую предпочтительность тех или иных вариантов их текущего законодательного обеспечения в национальных юрисдикциях европейского континента»[7].

Как нельзя к месту слова Князева С.Д.: «Не имея тех принудительных средств, которые есть у национального суда, международный суд не может приказывать государствам, он должен брать своей убедительностью, выверенностью, если надо — дипломатичностью своих решений, выстраивая баланс между необходимостью защиты общеевропейского правового пространства и европейских ценностей и особенностями каждого члена европейской семьи».

При разработке Конвенции в 1950 году и создании Европейского Суда по правам человека многие актуальные на настоящее время проблемы и правовые коллизии не существовали и не попадали под юрисдикцию ЕСПЧ. Поэтому и стали все больше и больше возникать правовые конфликты и расхождения, под вопросом стал принцип невмешательства во внутренние дела государства, защита суверенитета и независимости государства. Тот факт, что за последние годы взаимосотрудничество Европейского Суда и целого ряда стран-участниц перешло в противостояние, а социальная легитимность решений Европейского Суда стала рушиться, свидетельствует о появлении объективной проблемы - проблемы, связанной с эволютивным толкованием Конвенции по правам человека, а никак не субъективного мнения или конфликта с конкретной страной. Настоящие взаимоотношения пришли к своему упадку и логическому завершению.

Подводя итоги хотелось бы отметить, что складывающиеся отношения между Европейским Судом по правам человека и целым рядом стран-участниц Конвенции показывают, что имеющаяся система взаимоотношений перестала работать должным образом, а цели, стоящие у истоков создания международного суда и защиты прав и свобод человека перестали реализовываться на самом деле. Именно поэтому сегодня время переосмысления и поиск новых решений.

References

1. S.D. Knyazev Executive Force of the ECtHR Judgments in a Legal System of theRussian Federation (on the Basic of the Practice of the Constitutional Court)// Journal of Russian Law. 2016. №12. P.11.;

2. Lakeeva E. «What the ECHR is criticized for in different countries» 14.01.2014г.// https://pravo.ru/review/view/100539/ [Published in Russian];

3. The UK has completed the Brexit process and left the European Union // https://www.interfax.ru/world/743826 [Published in Russian];

4. Its own rules - How the Supreme Court of Britain will help the Constitutional Court of Russia "overcome" the ECHR // https://pravo.ru/review/face/view/126068/ [Published in Russian];

5. British reasons to abandon the ECHR // https://pravo.ru/review/view/117334/ [Published in Russian];

6. Filing complaints to the ECHR and enforcement of its decisions after Russia's exclusion from the Council of Europe // https://ilpp.ru/echr_denunciation [Published in Russian].

[7] Князев С.Д. Обязательность постановлений ЕСПЧ в правовой системе России (на основе практики Конституционного Суда Российской Федерации)// Журнал Российского права. 2016. №12. С.11.

THE STATE AS A SUBJECT OF TAX RELATIONS

Zhusupov A.D.
Doctor of Law, Professor,
" ACDO KEU"
Astana, Republic of Kazakhstan
DOI: https://doi.org/10.5281/zenodo.7541082

ГОСУДАРСТВО, КАК СУБЪЕКТ НАЛОГОВЫХ ОТНОШЕНИЙ

Жусупов А.Д.
д.ю.н., профессор,
«АЦДО КЭУ»
Астана, Республика Казахстан

Abstract
This article examines the role and position of the state in the system of tax relations. Taxes are set by the state and at the same time are the main source of financing of the state's activities. However, when it comes to the subject of tax relations, in most cases the state as such is not mentioned.

Аннотация
В данной статье рассмотрена роль и положение государства в системе налоговых отношений. Налоги устанавливаются государством и в тоже время являются основным источником финансирования деятельности государства. Однако, когда речь идет о предмете налоговых отношений, в большинстве случаев государство как таковое не упоминается.

Keywords: Kazakhstan, Constitution, state, law, tax legislation, taxes, tax rates, tax system, budget, taxation.
Ключевые слова: Казахстан, Конституция, государство, закон, налоговое законодательство, налоги, налоговые ставки, налоговое система, бюджет, налогообложение.

Теоретическая база налогового права развита недостаточно, что затрудняет разработку налогового законодательства. Это было четко определено при разработке Налогового кодекса Республики Казахстан.

В частности, роль и положение государства в системе налоговых отношений. Вполне очевидно, что налоги устанавливаются государством и в тоже время являются основным источником финансирования деятельности государства. Однако, когда речь идет о предмете налоговых отношений, в большинстве случаев государство как таковое не упоминается и сводится к государственным учреждениям.

В данном случае, по видимому, имеет место не понимание предмета налоговых отношений. Поскольку деятельность, связанная с налогами, не популярна в обществе, государству выгодно дистанцироваться от этой деятельности.

В целом, причины этих действий вполне понятны. Налогообложение является серьезным социальным вопросами действительно является летописью государства. Однако все они являются частью единого государственного института. Более того, поскольку нет четкого законодательного определения истинной роли государства в налогообложении, его можно трактовать как институт с чисто социальной ролью, при этом государство-налогоплательщик действует в интересах и в интересах своих граждан.

Таким образом, снимается протест общества против государственной системы налогообложения. В Республике Казахстан обязанность платить налоги возведена в ранг конституционной обязанности гражданина.

Конституция Республики Казахстан требует уплаты налогов, а также сборов. К "иным обязательным платежам", о которых говорится в статье 35 Конституции Республики Казахстан, относятся, прежде всего, налоги, пожертвования и таможенные пошлины [1, с.54].

Среди них в настоящее время используется типичный налог - "отчисления от пользователей дорог" в Дорожный фонд. Термин "взносы" связан с обязательными страховыми взносами [2, с.31].

Согласно Конституции Республики Казахстан, государственные налоги и сборы вводятся Парламентом или Президентом Республики только в случаях, предусмотренных Конституцией. Поскольку законодательного регулирования по вопросу сборов не существует, размер сборов может быть установлен Парламентом. Размер сбора может быть установлен любым местным органом власти.

На территории Республики Казахстан существуют национальные налоги. Эти налоги выступают в качестве источника корректировки государственного бюджета Республики Казахстан. Отчисления от государственных налогов включаются в доходы соответствующих бюджетов в порядке, установленном Законом Республики Казахстан о республиканском бюджете на очередной год, а местные налоги и сборы -в доходы, за счет которых финансируются местные бюджеты. Все налоги, применяемые в Республике Казахстан, делятся на косвенные и прямые. Косвенные налоги включают

налог на добавленную стоимость (НДС) и акцизный сборов.

Однако это не распространяется на случаи, когда налоговым законодательством Казахстана и договорами об использовании, заключенными компетентными органами, уполномоченными Правительством Казахстана, предусмотрена оплата в натуральной форме, и когда налог уплачивается в иностранной валюте в соответствии с Таможенным кодексом Казахстана.

Налоговые льготы или снижение налоговых ставок, предусмотренные действующим Указом, могут производиться путем внесения изменений и дополнений в Указ и в соответствии с договорами, заключенными с Государственным комитетом по инвестициям Республики Казахстан в соответствии с Указами и Законом Республики Казахстан "О государственной поддержке прямых инвестиций". За исключением инвестиционных льгот, предоставляемых в соответствии с Законом Республики Казахстан "О государственной поддержке прямых инвестиций", никакие другие законные налоговые льготы, включая льготы личного характера, не допускаются.

Дизайн налоговой системы в Казахстане во многом зависит от того, как распределены функции управления между национальными и местными органами власти, но следует помнить, что социальное налогообложение должно быть интегрировано в общую налоговую систему в ограниченной степени, в зависимости от приоритетов, выбранных государством. Статья2 Налогового кодекса четко определяет вопрос регулирования налоговых и других обязательных платежей в бюджет. На лицо не может быть возложена обязанность уплачивать налог или иной обязательный платеж, не предусмотренный Налоговым кодексом, аналоги иные обязательные платежи в бюджет могут быть введены в действие, введены, изменены или отменены в порядке и на условиях, установленных Налоговым кодексом. Принятие этих норм означает, что вопросы уплаты налогов и других обязательных платежей в бюджет регулируются только Налоговым кодексом.

В настоящее время, согласно законодательству Республики Казахстан, другие обязательные неналоговые доходы, поступающие в бюджет, регулируются различными законами и постановлениями Правительства Республики Казахстан. Согласно статье 54 Конституции Республики Казахстан, только Парламент вводит или отменяет налоги и сборы. Соответственно, данные положения предусмотрены в Общей части Налогового кодекса, что исключает принятие дополнительных платежей и сборов в бюджет, непредусмотренных Налоговым кодексом, в других законодательных актах Республики Казахстан.

Внесение изменений в Налоговый кодекс является единственным способом введения каких-либо платежей и сборов.

Содержание Налогового кодекса показывает, что только Налоговый кодекс может выступать в качестве акта, определяющего и устанавливающего налоговые отношения. Однако запрещается включение норм о налоговых отношениях в иные законодательные акты, кроме Налогового кодекса, за исключением случаев, предусмотренных Налоговым кодексом. Это очень важное положение означает, что нормы Налогового кодекса применяются для целей налогообложения даже в том случае, если законодателем принят закон, регулирующий налоговые отношения.

Большой интерес представляют организационные и технические аспекты выше упомянутой налоговой реформы в Республике Казахстан, которые сводят отношения между налогоплательщиками и налоговыми органами к жестким правовым рамками уточняют роли представителей и исполнительных органов различных уровней в формировании и реализации налогового законодательствах.

References

1. The Constitution of the Republic of Kazakhstan, dated August 30, 1995, with amendments and additions on. 08.06.2022.

2. The Code of the Republic of Kazakhstan dated December 25, 2017 "On taxes and other mandatory payments to the budget". Tax Code (as of 01.07.2022)

3. Alibekov S.T. Tax law of the Republic of Kazakhstan: Textbook – Almaty : KazUMO and MYA, - (CD-ROM).

4. Financial and tax law of the Republic of Kazakhstan. Study guide. Team of authors: Omarova R.Z., Nurmagambetova A.B., under the general editorship of Doctor of Law, Professor Zhusupov A.D. Astana, 2015 – 258 p. - Access mode: http://www.iprbookshop.ru .— EBS "IPRbooks"

5. Comments on the Code of the Republic of Kazakhstan "On Taxes and other mandatory payments to the Budget" (Tax Code), (as of 04/19/2019) Ed. 2 volumes Almaty, 2020.-778.

PEDAGOGICAL SCIENCES

TEACHERS' ATTITUDES TOWARDS THE IMPORTANCE OF DEVELOPING RESEARCH SKILLS AMONG HIGH SCHOOL STUDENTS

Burkhan B.
Master sudent
'7M01719-Training of foreign language teachers'
Kazakh Ablai Khan UIR and WL
Almaty, Kazakhstan
DOI: https://doi.org/10.5281/zenodo.7541108

Abstract
This article is devoted to the problem of developing research skills among high school students. This study aims to provide an insight into how teachers perceive the development of research skills among high school students. Particular attention is given to the influence how the formation of research skills and abilities becomes an integrative component of the pedagogical process in a modern school with the spread of the practice of conducting educational research by high school students.

Keywords: research skills, formation of research skills, research competence, foreign language education

Introduction

Performing the functions of a social institution of the twenty-first century, the modern school is focused on preparing each graduate for an informed choice of life path. The dynamically changing socio-economic situation requires young people to analyze the situation, engage in various activities, and, accordingly, the role of research skills and abilities increases. The formation of research skills at the senior level of school contributes to the expansion of individual cognitive experience and the formation of the research position of high school students.

Accordingly, the most important task of education at the present time is the development of research skills that are focused on the research activities of students. Involving students in research activities will allow them to learn how to invent, understand and master new things, express their own thoughts, be able to make decisions, formulate interests and realize opportunities.

Effective educational research develops not only research skills, but also learning skills in collaboration, communication, thinking (critical and problem-based thinking). The teacher must provide the necessary conditions for the development of research skills: purposefulness and consistency, creative environment, psychological comfort, motivation, personality of the teacher and consideration of age characteristics. The key point here is careful planning of the educational research. It is necessary to teach how to ask (formulate) scientific questions correctly, draw up a research plan, give priority to evidence, formulate conclusions (explanation) and link them with scientific knowledge. In order to this, the formation of research skills and abilities becomes an integrative component of the pedagogical process in a modern school with the spread of the practice of conducting educational research by high school students. In order to do this, a teacher today needs to own a large set of tools and methods for organizing research activities.

Therefore, the present study aims to investigate teachers' attitudes towards the importance of developing research skills among high school students. Specifically, this study addresses the following research questions:

1. Should development of research skills be incorporated in the classroom?

2. If yes, what research skills should be developed among high school students?

LITERATURE REVIEW

Definition of research skill

Research skills are considered as complex skills, since they include the simultaneous work of different psychological and theoretical ways of perception. Considering the concept of "research skills", it is impossible to give a clear definition. Both the components of this definition and the full definition of research skills are multifaceted and functional, and do not have one specific point of view.

V. N. Litovchenko defines research skills as a set of systematized knowledge, skills and abilities of a student, views and beliefs that determine functional readiness of a high school student for creative search solutions of cognitive tasks.

There are several approaches to the definition of "research skills": for example, V.V. Uspensky, I.A. Zimnaya and E.A. Shashenkova, N.L. Goloviznina and others consider research skills as a result and measure of research activity, i.e. as the ability to conduct independent observations, experiments acquired in the process of solving various kinds of research tasks. The authors of another approach, N.V. Sychkova, P.Yu. Romanov, M.N. Povolyaeva and others, consider research skills as the ability to take actions necessary to carry out research activities.

From the point of view of V.V. Uspensky, a research skill is "the ability of independent observations, experiments acquired in the process of solving research problems." The author also notes that "the skills of a researcher presuppose ... the ability to compare, analyze, isolate essential features, make generalizations and conclusions."

By general research skills, A.I. Savenkov understands the ability to see problems, ask questions, put

forward hypotheses, define concepts, classify, observe, conduct experiments, draw conclusions and conclusions, structure material, work with text, prove and defend their ideas.

According to P.V. Seredenko, research skills are an opportunity and its realization to perform a set of operations for the implementation of intellectual and empirical actions that make up research activities and lead to new knowledge.

The following approaches to the definition of the concept of "research skills" were outlined by G.V. Mukhamadiyarova:

- the ability of independent observations, experiments acquired in the process of solving research problems;

- possession of a complex system of mental and practical actions necessary for cognitive activity in all types of educational work;

- the ability to apply a particular research method in solving a given problem or research assignment;

- a system of intellectual and practical skills of educational work necessary for the independent performance of research or part of it.

Formation of research skills

Based on these scientific works, creatively working teachers strive to organize the research activities of schoolchildren in the practice of teaching. Since research activity is quite complex, it is studied in the vast majority of cases in adolescents. It is believed that younger students are not ready for it.

In this regard, an urgent problem today is teaching school children how to obtain and process scientific information through independent research activities within the competence approach. The competency-based approach in education is generally understood as an approach that focuses not on the content, but on the results of education expressed in the form of competencies (Azizov & Azizov, 2018). Research competence is interpreted by Aleksandrova and Sluchayna (2018) as the ability to conduct independent research and provide its results. Research competence is both the main task of the development of professional and methodological competence and a means of developing other professional, cultural and general competencies (Gorshkova, 2017).

Currently, the research function of professional activity is prioritized since it is linked to the growth of the teacher's research competence and results in high-quality student instruction. The issues surrounding the development of research competence are the focus of Mallaev's (2014) and Mura's (2012) research projects. The writings of Andreev (2012) and Kodjaspirov examine the theoretical underpinnings of this issue (2016).

The works of Avdeeva, Andrianova, and Nikulina take into account research activity in the context of professional pedagogical and sociological reflection (2014). Scientists from other countries are researching the unique characteristics of the development of research skills. Their research examines how each student's abilities change across online academic courses based on self-regulating research (Cohen & Baruth, 2017), focusing on how students' research skills are activated (Tuisk, 2008).

Bostrom & Sandberg provide insight into the challenge of creating professional activity kinds that take into account students' creative talents and the growth of their research independence (2009). Koletvinova & Bichurina take into account how research in the cognitive-integration direction is developing (2016).

Based on the creation of new information and its practical application, the research paradigm is seen as an essential part of the diverse human life (Larin, 2003; Andreev, 2012; Kiseleva, 2016).

METHODS

Research Design

This study employed a quantitative research method to identify the attitude of teachers to the development of research skills in high school students. This survey was conducted using an online questionnaire. The online questionnaire was prepared using Google Forms and distributed via social networks using the snowball method among the teaching staff from Almaty, Kazakhstan. The questionnaire was originally written in English.

Participants

The study involved 15 foreign language teachers who work with high school students. All of the participants are proficient in digital literacy; however, the objective may also be appropriate for individuals who are new to the teaching profession.

Table 1

Gender	Degree	Experience	Class
Female-**13 (86.7%)**	Undergraduate-**4 (26.7%)**	1-5 y.-**10 (66.7%)**	10th - **13 (86.7%)**
Male-2 **(13.3%)**	Master's-**11 (73.3%)**	5-10y.-**4 (26.7%)**	11th – **5 (33.3%)**
Prefer not to say	doctorate	10 or more – 1 (6.7%)	

Participant teachers' profiles show that most of the teachers' gender is female and most of them have master's degrees, which shows that they are aware of the methodology of FLT and its main conceptual basis. Most teachers' experiences vary from 1-5 years.

Instrument

The data were gathered by the researcher using an English-language questionnaire. Part 1 focused on revealing the importance of developing research skills (5 items), and Part 2 indicated specific research skills that teachers should develop in their educational process. The total number of items was 10, and they were separated into two sections (5 items). First, a Likert scale with five response options—strongly agree (1), agree (2), neutral (3), disagree (4), and strongly disagree (5) — was used. The second section of the survey consisted of multiple choice questions and a written format question that asked participants to choose specific research skills that high school students need to develop.

Research Procedure

Before beginning the study, the researchers developed the questionnaire, examined the pertinent literature, and assessed the validity of the tool. The questionnaire was sent to the intended respondents after it met the criteria. The complete privacy of all information submitted was again emphasized. After then, data analysis was performed after making sure the data were accurate. An investigation of instructors' attitudes toward acquiring particular research abilities was examined in order to provide a full pedagogical application.

RESULTS

Research question 1

Analysis on five scales was done in order to determine the average values of the teachers' responses to the question "Should development of research skills be incorporated in the classroom?". Results indicated in Table 2 showed positive viewpoint of teachers' attitudes by interpreting answers to the following questions:

Table 2

Participant Teachers' answers

Questions	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
1. The formation of research skills and abilities becomes an integrative component of the pedagogical process in a modern school with the spread of the practice of conducting educational research by high school students	6 (40%)	6 (40%)	1(10%)	1(10%)	-
2. Teachers should incorporate exercises on the development of research skills in their lessons.	7 (46.7%)	6(40%)	2(13.3%)	-	-
3.It is important to organize research activity in order to develop high school students' research skills in the educational process.	12(80%)	2(13.3%)	-	1 (6.7%)	-

Research question 2

The purpose of the second questionnaire was to find out what research skills should be developed among high school students. The results of the questionnaire indicated in Figure 1 shows that 10 teachers think that creating effective research strategy skills (66.7%), and 9 teachers consider effectively communicating their arguments/thesis skills (60%) need to be developed.

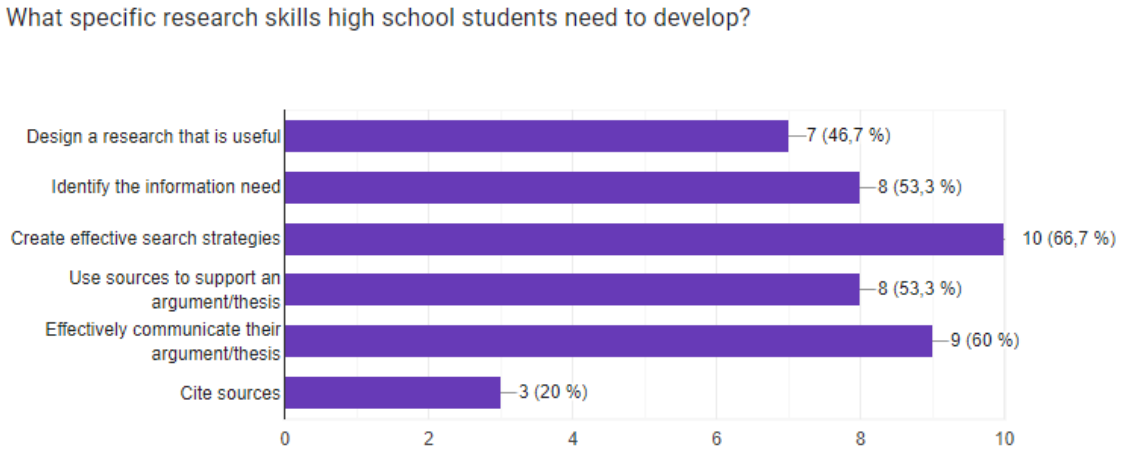

Figure 1

According to participants' answer in Table 3 listed research skill(s) which high school students need the most help with:

Table 3

1. Find appropriate information according to the topic
2. Analysis of information from different sources.
3. Analytical research skills
4. Selecting and analyzing relevant sources
5. Conducting various types of research as well as organizing data in various ways

Analyzing the answers of teachers, we can understand how important it is to develop students' analytical thinking and the ability to use the necessary literature for research. This proves that teachers should pay attention to the development of research skills in high school students.

Discussion

The primary purpose of the study was to identify the perceptions of teachers on the importance of developing research skills among high school students. As mentioned in literature review, the concept of research skill is quite complex. After analyzing the results of the questionnaire, teachers understand that developing research skills provides conditions for the productive development of their value, intellectual and creative potential, is a means of activating students, forming their interest in the studied material, allows them to significantly expand the scope of the studied material, forms subject and general skills. As N.I. Savenkov mentioned, the question of when students' own research began to be applied in educational practice has a clear and precise answer – they have always been used and have been in demand since ancient times, from the moment when the very need for learning manifested itself in the human community. The student always perceived some part of the information about the world reproductively from the elders, and mastered some independently, imitating adults, playing, exploring reality, while he had to observe, experiment and make his own conclusions and conclusions on this basis (Savenkov, 2010).

Throughout the study, teachers demonstrated favorable views toward the development of research skills such as identifying and finding appropriate information according to the topic. It can be proved by Ivashova O.A, she believes that research skills are understood as intellectual and practical skills due to the independent choice and application of methods and methods of research on materials available to students (Ivashova, 2009). Thus, it is suggested to help high school students develop these skills during the educational process.

Revealing the attitude of teachers on the development of research skills, it was found out that teachers have a positive attitude towards the use of exercises that develop specific research skills in their lessons including research activities. In order to this, Sokolova N.G that the key technological element in the development of research skills is a heuristic educational situation – a situation of activating ignorance, the purpose of which is the birth of a personal educational product by students (ideas, problems, hypotheses, versions, text). The methodology of developing research skills is based on open tasks that do not have unambiguous "correct" answers. Almost any element of research activity can be expressed in the form of an open task. (Sokolove, 2005)

Concluding, the current study has identified how teachers perceive research skills and whether it should be taught.

Conclusion

On the basis of research results, it can be concluded that there is a dire need to educate students and develop their research skills. One of the most important tasks of our teachers is to educate a caring, active, thinking person. To do this, it is necessary to find additional forms of educational activity in which schoolchildren could take part on a voluntary basis — based on interest in a particular direction.

One of such forms is research activity, which is created with the aim of improving students' knowledge in a certain field of science, their acquaintance with the methods of scientific cognition; development of students' interests and abilities, acquisition of skills and abilities of search and research activities, as well as understanding the deep connection that exists between individual academic disciplines.

Thus, it can be concluded that research activity directly depends on the formation of the student's research skills. The acquisition of these skills directly depends on the actions performed by him through properly constructed work in the lesson. In order to build it correctly, the teacher must know what functions research skills have to develop the right actions, both in the scheduled work and in extracurricular activities. Only joint activity with the teacher during the entire study will give the student the opportunity to master new knowledge, skills and abilities, improve existing ones and master universal learning activities.

References

1. Alekseev N. G., Leontovich A.V., Obukhov A. S., Fomina L. F. The concept of development of students' research activity // Research work of schoolchildren. - 2002. – No. 1. – pp. 24-33.

2. Bogoyavlenskaya D. B. Research activity as a way of developing creative abilities / D.B. Bogoyavlenskaya // Research activity of students in the modern educational space: collection of articles – M., 2006. – pp. 40-50.

3. Ivashova O.A. Development of research skills in schoolchildren: methodological aspect / O.A. Ivashova. – St. Petersburg: Cult-Inform-Press, 2008. - p.385

4. Kasimov E.V., Gasanova M.N. FORMATION OF RESEARCH SKILLS IN OLDER ADOLESCENTS IN AN INNOVATIVE EDUCATIONAL ENVIRONMENT // Modern problems of science and education. – 2014. – № 6. ;

5. Kozhukhova M. Y. Formation of research skills of high school students in the scientific society of students : abstract. diss. ... Candidate of Pedagogical Sciences: 13.00.01. – Orenburg, 2004. – p.22

6. Kraevsky V. V., Khutorskoy A.V. Fundamentals of education. Didactics and methodology : studies. manual for students. higher. studies. institutions. – 2nd ed., ster. – M. : Academy, 2008. – p. 352

7. Kukar U. Yu. Development of research skills of high school students in the institution of additional education : abstract. dis. ... Candidate of Pedagogical Sciences : 13.00.01. – Magnitogorsk, 2010. – p. 23

8. Leontiev A.N. Activity. Conscience. Personality. – M.: Sense; Academy, 2004. – p.346

9. Savenkov A.I. Pedagogical psychology / Textbook for students of higher studies institutions. – M.: Publishing center "Academy", 2009. – p.240

PHILOLOGICAL SCIENCES

PROJECT MANAGEMENT SOFTWARE UTILIZATION PERFORMANCE VOCABULARY COMPOSITION

Lavrova A.
Doc., Prof.
Professor of the Department of Foreign Languages
R.E. Alekseev Technical University in Nizhny Novgorod
DOI: https://doi.org/10.5281/zenodo.7541124

Abstract

The paper deals with the IT/IS impact on the performance of engineering projects. The objective of the study is to investigate the level of a project management software package utilization from real package data. The investigation is considered to be a unique one. The methods used in the study are concerned with lexical, statistical and cognitive analyses The hypothesis of the paper is regarded with the detailed innovation vocabulary composition study. The perspective of the paper is concerned with the vocabulary studies to be developed and expanded.

Keywords: project management, real project data, software package, coordination analyses, information systems, technologies, composition etc.

The experimental part

The analyses done are based on a running standard the length of which comes to 14740 lexical units The impact of information technologies (IT) and information systems (IS) on organizations are numerous; they involve new organizational structure, and result in the increase of the productivity of the individuals to facilitate the increase of the organizational productivity. These systems allow to reduce the size of organizations to facilitate the coordination inside.Better coordination allows to release more complex projects to bring together many factors. The IT and IS help organizations to improve their detection capability, and capacity to response.

The innovative vocabulary fully corresponds its advanced engineering, and scientific sphere; the objective of the paper is concerned with the vocabulary description in full.

The composition of the innovative vocabulary is rather complicated because the scientific and engineering sphere dictates to develop a highly organized systematic vocabulary. The vocabulary systematizes groups of lexemes to be regarded like pure scientific and engineering the same time. These systematic groups are the main characteristics of the analyzed vocabulary. It is not advisable to divide such groups organizations into small fragments but recommended to analyze them upon the whole. The highly specialized groups are represented by the following groups combinations. They are: the impacts of IT/IS on the performance of engineering projects; IT/IS engineering projects are really based on real data projects; the objective is to investigate the level of utilization from real project data; results stemming from non-parametric tests, and correlation analyses show etc. The fact is that the above examples suggest such specialized groups to represent in reality the sentences but these models can be considered like innovative separate and well developed groups. Such interpreting is dictated by the engineering science sphere the vocabulary develops. The above examples are existing models the science chooses. Such a division of the analyzed vocabulary helps understand the present science and technology sphere. The presented fragments create a vivid picture of the demonstrated process at once. It gives the immediate picture the engineering science displays. Such groups formations are suggested to be called accomplished developed specialized groups which can interpret the specialized incoming professional information. The information is likely to be a very actual one as specialized groups occupy the central position of the vocabulary studied. These professional groups submit the exact & detailed information to concern the problem. Inside the groups there are subjects and predicates like in traditional sentences but the innovative science and engineering professional information in systematically organized and completed specialized groups occupy their special place in the highly professional vocabulary Besides there are also infinitive specialized groups to concretize the information submitted: to produce the size of organizations to facilitate the coordination within the organizations; to investigate the level of utilization of the project management software package; to make better decisions; to maintain a competitive advantage to implement an effective project management; to investigate the level of a project management software; to examine the relationship between system utilization and project performance; to achieve economy of scale; to reduce general and administrative costs; to ensure a better inventory turnover. The above infinitives groups help fix the details of some very important science and engineering events ; sometimes the infinitives of further action are widely used in the observed vocabulary; to connect IT/IS to the characteristics of the project to improve the project performance; to simultaneously manage more projects to reduce the duration of projects etc. The fist infinitive fulfils the function of the right attribute, and the second one realizes the function of the further action. Participle 2 constructions are observed in the specialized vocabulary: the information required for good operations of the organization; the subsystems usually found in a project management software packages; a project management software developed by an

engineering construction; the variables studied; an engineering construction firm recognized internationally; the variables considered in this study; the measures used in the existing literature; a subsystem divided by the projection duration etc. The above Participle2 constructions represent the function of the right attribute. These constructions give the possibility to verify some engineering process or an event to the corresponding form of which the Participle 2 construction refers to. Many components special words combinations are not rare phenomena in the studied vocabulary. These professional words combinations submit the verifying information to describe the obtained information. Let's address the illustrative material: perfect management software utilization, project management software package, the data collection process, project manager software' collective organizational management, project planning management system, enterprise software technologies, real project data, an engineering construction firm, social care information systems the engineering process management subsystem. Very valuable information comes from the tables to refer to project management subsystems. The tables represent all the information divided into two columns. The first one represents subsystems, and the second one describes functions. The subsystems analyzed are expressed by two- and many components words combinations to disclose all the information they involve. The examples of such words combinations: project definition, active planning, environmental management, health and safety management; estimating process management, working hours management, document control, document management, engineering process management procurement management, cost management, construction activity management. The above many components words combinations add a new innovation bloc to disclose the software subsystems vocabulary. The subsystems functions are represented by the following many components words combinations like project parameters, project characteristics. The above functions correspond to the following words combinations: highly specialized employees, classification codes, persons in charge, dates, contract type etc. As for the activity planning (to be represented like a system), the corresponding vocabulary specialized words combinations are fixed by schedule project activities and specific professional software. Environment management demands environmental plans management preventions, training and follow-up actions on inspections and accidents lexemes and words combinations. The health and safety management subsystem uses health and safely plans management, preventive measures, education, preventions inspections and follow up actions on accidents and incidents lexemes and words combinations. The estimating process management subsystem displays the specialized words combinations like detailed estimate of project, project work breakdown structure, work passages etc. The working hours management subsystem corresponds to the following specialized words combinations (many component ones): documents and active documents processes. The document control subsystem uses internal and external control documents generated during the execution of the project specialized word combinations. The document management subsystem includes the following vocabulary units: documents and archive documents processes. The engineering process management subsystem suggests such professional words combinations: equipment and materials resulted from engineering recording, purchase requisitions, engineering tools, interface with engineering tools. The procurement management subsystem deals with procurement processes, project purchasing, training contract administration, logistics, procurement follow-up and inspection, material management on site etc. The cost management subsystem corresponds to the following words combinations: the project budget follow up, invoicing and payments follow up etc. The constructive activities management subsystem refers to the words combinations: construction contracts, construction progress, activities management implementation.

So now we understand that each subsystem becomes the information source for other systems. And then f.ex the document management subsystem receives the information from the procurement management and engineering management subsystems. So a new block of professional engineering many component words combinations join the analyzed vocabulary : project definition, activity planning, environment management, health and safety management estimating process management, construction activity management, project management software package, working hours management, document control, cost management, procurement management, engineering process management, document management etc. So that is an additional bloc of inventory managements words combinations to refer to the Interaction between two subsystems The analysis of this vocabulary showed that the studies on the impacts of IT/IS engineering projects are rarely based on real data of projects. To recognize this limitation the objective of this paper is to investigate the level of use of the project management software vocabulary additions based on primary sources of project data. Specifically the objective of the vocabulary is to derive a software utilization profile for the best performance projects from the firm and to examine the relationship between system utilization and project performance. The specialized vocabulary has got all the inventory to require the project management software utilization problem; the inventory is highly scientific and engineering; the composition of the lexemes belonging to the analyzed vocabulary is of the Latin origin. The old Germanic lexemes are rather rare here but they are to fulfill some service functions. As for old Germanic verbs (irregular ones) they are rather limited in number; the studied scientific problem needs this 100% pure scientific style. The studied vocabulary uses the irregular verbs and common lexemes to be referred to the common lexemes register (Germanic verbs) to be used together with the Latin ones. As for the above constructions used they are really unique, and innovative ones; the composition of such a vocabulary is considered to be very complicated. It was noticed that the specific detailed information to concern groups and units to remind the real sentences with subjects and predicates specialized groups manifested like the parts of

Participle and Infinitive constructions are used. As for mono lexemes they are of rare usage and the most of them are represented by many component words combinations. The scheme of the vocabulary used is rather innovative like the science itself to be interpreted by the very vocabulary to concern project management software utilization. The way the information to be submitted is rather revolutionary. The problem is realized by long chains of sentences to have used subordinate clauses, and many details used to be verified. The problem shows the software level to be used, and some of the subsystems appear to be linked to project performance. The choice of scientific and highly specialized lexemes (of the Latin origin) used is rather unique.

The fact is that IT/IS is considered to be innovation tools for organizational management, and besides IT includes communication vehicles and tools to have included Internet, Intranet, e-mail, Videoconference etc to have ensured the linking between IS and individuals within organizations. And besides IS includes software and data bases to have used in the organizational management process, f. ex. ERP system, project planning management system etc. Many studies on the impacts of IT/IS on organizations to concern the determination, analysis and quantizing of the impacts of IT/IS on productivity, improvement of processes and innovation etc. were carried down. The above information says about innovation additional blocs of the vocabulary analyzed. These blocs bring various vocabulary specialized units to correspond the above information. First come vocabulary blocs to refer to the studies on the impacts of IT/IS: determination, analysis, quantizing, impacts, coordination, reactivity, effectiveness, learning capacities, to achieve economies of sale, to reduce general and administrative costs, organizational processes to ensure better inventory turnover, lack of studies, performance of engineering projects, a recommendation channel between the designers, and the use of data bases, common software, to facilitate the coordination, a complex project, increase in the number of multi-divisional projects, companies having implemented an ERP system, higher light importance to connect IT/IS to the characteristics of a project.

The above illustrations are the fragments of new additional blocs of specialized lexemes. These fragments are of different compositions; they differ in length to concern these fragments, and their fillings. Mono specialized lexemes are in wide use; there are examples to regard specialized and developed professional groups and the cases when the specialized lexemes sufficiently use conjunctions and prepositions (and, on, in, between, of, for etc). Infinitives developed groups are widely used here; Participle constructions are being practiced too (Perfect Participles, f.ex.). Two components specialized words combinations are fixed as well as three components and four components ones (project management software packages). Inside many components words combinations there can be the propositions, f.ex., a significant correlation between the efficiency of the project management system etc). Now such components words combinations are much longer But such words combinations are available, they do exist (f.ex. the quality of the project management information system, and the frequency of the use of PMIS has a positive impact on the performance of the project). Such long specialized many component words combinations which consist of many finished fragments links are joined by the conjunction “and”. These fragments of the studied vocabulary help estimate the importance of the vocabulary and understand that most vocabulary units are based on real project data and the level of use of a project management software and its link with the performance of projects.

Conclusions. So the investigation was carried out to be concerned with a specialized professional engineering project management software utilization, and project management (PMSU and PM). Upon the whole the scientific vocabulary includes the lexemes to answer the problem of PMSU PM science sphere. The vocabulary is complete, complex to be able to interpret any science innovating problem to regard PMSU PM. Its composition is varied. It unites mono specialized lexemes, many component words combinations, the length of which can vary sufficiently. Infinitives and Participles construes developed are widely used in different functions. Specialized construes like developed sentences to have possessed subjects and predicates are interpreted upon the whole and which can be considered as completed performance, and systematically organized groups of lexemes. The last vocabulary bloc formation is regarded like a highly innovative one. Thin vocabulary divisions help realizing mare complex projects to bring the best results to understand the essence of the analyzed problem. Such vocabulary peculiarities show the level of use of the software and some of its subsystems to be linked to project performance The analyzed vocabulary was thoroughly investigated to use different methods to have enclosed cognitive analyses, statistical, sociolinguistic etc. The studied vocabulary keeps not only the lexical units to depict the problem but also tables, f. ex., to concern project management software subsystems like interactions between subsystems, variables studied or CPI performance levels. The conclusive division of the vocabulary manifests the results to have been divided into the following subdivisions: software usage time and subsystems intensity of use with the table subsystems intensity mean scores table included.

As for the divisions it has got software usage time subdivision; as for results they are presented in detail. All the presented subdivisions of the above vocabulary were thoroughly analyzed. For project management practitioners the studied vocabulary provides rather broad insights for the engineering projects. The above vocabulary showed that project performance is defined in terms of schedule, scope and cost. The results of the vocabulary researches are under the project performance criteria. Another limited project would bring different findings. So the project management system data vocabulary is organized like, f.ex. its standard scheme of a science project criteria show. All the vocabulary data collected during the experiment are presented through the experimental procedure to be reliable and sufficient.

References

1. Lavrova, Alexandra. Genome& Bioinformatics Lexicon Research History/ Alexandra Lavrova // Norwegian journal of the International Sciences.-2020. №39. -V.4, P.33-38. DOI

2. Lavrova, Alexandra. Interactive Robots Electrons Skin manufacturing Vocabulary Investigation/Alexandra Lavrova // Global Science Potential SPB: the fund of science and culture development. № 7 (124), 2021. P.195-200. VAK

3. Lavrova, Alexandra. Laptop Developing History Vocabulary// Deutsche Internationale Zeitschrift: Satteldorf, Artmedia.-2021.№24. -P.56-59. DOI

4. The Oxford Universal Dictionary Illustrated on Historical Principles.- Oxford Univ. Press, 1974.

PHYSICAL SCIENCES

WHY IS AN INCORRECT VERSION OF THE SPECIAL THEORY OF RELATIVITY THAT DENIES THE POSSIBILITY OF THE EXISTENCE OF RADIO AND ELECTRICAL ENGINEERING BEING STUDIED IN TEXTBOOKS OF PHYSICS? [8]

Antonov A.A.
PhD, HonDSc, HonDL, ResProf., H.ProfSci
Independent researcher, Kiev, Ukraine
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Abstract

The article states that the existing version of the special theory of relativity (STR) is incorrect, since relativistic formulas obtained therein are incorrect; they have been incorrectly explained by using the incorrect principle of speed of light non-exceedance and entailed wrong conclusions about physical unreality of imaginary numbers and existence of only our visible universe. It mentions experimental evidence of the foregoing, obtained by the author within study of transient and resonant processes in linear electric circuits. It is shown that the existing version of the STR implies conclusions on nonexistence of tsunami and bell ringing, piano music and swinging children's swings, as well as many other real processes. It is also shown that the existing version of the STR denies even the possibility of existence of radio- and electrical engineering. Therefore, it is concluded that existing university physics textbooks should be corrected.

Keywords: Special theory of relativity, physical reality of imaginary numbers, theory of linear electrical circuits, radio engineering, electrical engineering.

1. Introduction

The special theory of relativity is now presented for study in all university physics textbooks and its creation by Joseph Larmor [1], Nobel Prize winner Hendrik Anton Lorenz [2], Jules Henri Poincaré [3], Nobel Prize winner Albert Einstein [4] and other prominent scientists is rightfully considered the greatest achievement of physics of the 20th century. However, its creation stopped halfway due to the lack of necessary experimental knowledge at that time and the inability of its authors to correctly explain the relativistic formulas obtained in STR. They did not know how to explain that according to these formulas all the results of calculations at superluminal velocities turned out to be imaginary numbers discovered by Scipione del Ferro, Niccolò Fontana Tartaglia, Gerolamo Cardano, Lodovico Ferrari and Rafael Bombelli [5] 400 years ago. It is also possible that Paolo Valmes [6] was even first to make the scientific discovery, for which he was burned by the sentence of Spanish inquisitor Thomas de Torquemada. But it was necessary to explain these formulas, because a theory that even its authors could not explain would be of no use to anyone. Therefore, a postulate called the principle of light speed non-exceedance was introduced into the STR. The postulate implied that a situation at superluminal velocities might be unexplained, as people would never face it. Consequently, a belief that imaginary numbers were physically unreal turned out to be possible. Thus, relativistic formulas appeared to be explainable.

It was convenient, but unproven and, as it turned out later, incorrect. But in this form, the generally accepted version of the STR was studied in all university physics textbooks. And it is still studied today.

However, this postulate was refuted by the discovery of Cherenkov radiation [7], for which Pavel Alekseyevich Cherenkov, Igor Evgenyevich Tamm and Ilya Mikhailovich Frank received the Nobel Prize in 1958. And at that time the generally accepted version of STR was saved by specification that the principle of non-exceeding the speed of light refers to the speed of light only in a vacuum. But by numerous experiments [8]-[23] performed in the 21st century it was proved that such corrected formulation of the principle of non-exceeding the speed of light is also incorrect. As it turned out, this formulation was refuted by the existence of natural phenomena known from time immemorial - tsunami, bell ringing, music created by pianos and even swinging after pushing by parents children swings, which the authors of STR at its creation did not take into account. This formulation was also refuted by the existence of radio- and electrical engineering.

As a result by all these experiments and the mentioned natural phenomena a very important general scientific principle of physical reality of imaginary (and consequently also complex and hyper-complex) numbers by which the really existing huge and still completely unknown to the modern science world is described was proved. And the use of the principle of physical reality of imaginary numbers as applied to the universally accepted version of STR allowed us to conclude that the relativistic formulas obtained in this version are wrong in general, because at hyperluminal

[8] This is reprint of the article "Antonov A. A. "Why the physics textbooks tech am incorrect version of the special theory of relativity which denies the existence of radio- and electrical engineering". Challenges and problems of modern science. Proceedings of the III International Scientific and Practical Conference. London, United Kingdom. 2022. pp. 78-86. https://conference-w.com/

speeds they correspond to an unstable, i.e. instantly self-destructive, physical world.

What is the most surprising is that, despite all the aforementioned sensational experimental refutations[9] [24]-[44], the incorrect version of the STR has still been groundlessly believed to be correct and studied in all university physics textbooks, as well as naturally used by physicists in their fruitless scientific research - for example, in attempts to understand what is dark matter and dark energy while performing research at the Large Hadron Collider. It is completely unclear why a single disproving experiment is enough to refute other hypotheses and theories in physics and other sciences, whereas the existing version of the STR turned out to be irrefutable despite all the experimental and theoretical proofs of its falsity. Moreover, in the USSR even three times in 1934, in 1942 and in 1964 by the decisions of the Central Committee of the All-Union Communist Party (Bolsheviks) and the Presidium of the Academy of Sciences of the USSR, which have not yet been canceled, it was generally forbidden to criticize this theory. That's why the question raised in the article title is very important and ways and rates of further science development would depend on answer thereto.

Further, we will try to answer this question.

2. From STR it follows that radio engineering and electrical engineering should not exist in nature

And we will make this attempt on the example of one more refutation of the generally accepted version of STR. On the assertion that STR on the one hand and radio engineering (and electrical engineering too) on the other hand mutually refute each other [45]-[54]. But since there can be no doubt about the existence of radio engineering and electrical engineering, it is obvious that then the existing interpretation of SRT is incorrect.

But do the STR and radio engineering actually refute each other? Let's check it out. Let's look at the arguments of SRT. It follows from the fundamental principle of the STR on light speed non-exceedance that imaginary numbers[10] have no real physical content. In other words, objects and phenomena described using imaginary numbers do not exist. This expressly follows from the version of the STR set forth in all university physics textbooks. And neither authors of the textbooks nor anyone else can still explain what, for example, 5i meters, 200i grams or 300i meters, where $i = \sqrt{-1}$ is, whereas everyone knows what 5 meters, 200 grams or 300 meters is. That's why the principle of light speed non-exceedance used in the STR has caused no objections.

However back in 1893 Charles Proteus Steinmetz (original name Karl August Rudolf Steinmetz) offered, as applied to linear AC circuits, his interpretation[11] of Ohm's law, discovered by Ohm in 1826 as applied to DC circuits. According to his theory, called a linear circuit symbolic analysis method, not only resistors, but also capacitors and inductors have resistance referred to in Ohm's law. Herewith, resistance of resistors R is measured by real numbers, and resistance of capacitors C and inductors L is measured by imaginary numbers $j\omega L$ and $-j/\omega C$, where $j = \sqrt{-1}$ is the so-called imaginary unit[12], and ω is the frequency of applied voltage. But in accordance with the principle of light speed non-exceedance their resistances do not actually exist, just as on the same basis in accordance with the STR there are no relativistic mass, time and length at superluminal velocities. They are even called imaginary resistances in the theory of electric circuits.

Consequently, real electrical resistance of any LCR - circuit must always be determined only by resistors R included in this circuit and be measured by real numbers. Therefore, the current flowing through such an electrical circuit should not depend on the value of the frequency of the applied voltage.This means that there could be no resonance in such electric circuits, and electrical filters could not be created. For this reason, existence of radio engineering and electrical engineering is also completely impossible.

3. However, it follows from the existence of radio engineering and electrical engineering that the version of SRT studied in all physics textbooks is incorrect

Now, let us come to think of it.

There is no doubt that nature is one and the laws of nature are also one. Always and everywhere. Be it on Earth, or in the depth of space, or in the microcosm, or in animate or in inanimate nature. However, people, due to their limited intellectual capacity, are able to absorb only a very small part of this knowledge. Norbert Wiener wrote in this regard: "Important researches sometimes delayed by the unavailability in one field of results that may have already become classical in the next field"

That was what happened in physics in the 20th century.

Physical reality of imaginary numbers unknown in physics to this day had been known in radio engineering even before the STR was created. Moreover, there are other sciences that use imaginary numbers besides physics. Unlike physics that has still had no idea of physical interpretation of relativistic formulas of the STR at superluminal velocities (therefore, the principle of light speed non-exceedance proved to be in demand in the STR), radio engineering textbooks perfectly explain the use of imaginary numbers.

[9] Which, in contrast to the widely publicized unsuccessful OPERA experiment, were quite reliable and, having been done before the OPERA experiment, made it unnecessary

[10] Naturally, it makes sense to talk about the physical reality of imaginary numbers, as well as real numbers, only in relation to named numbers, equipped with indications of the units used for the corresponding parameters of physical objects and processes.

[11] On which he made a presentation at the International Electrical Congress and, in addition, in the proceedings of the American Institute of Electrical Engineers published an article "Complex quantities and their use in electrical engineering."

[12] In the theory of electric circuits the imaginary unit is commonly denoted by the letter j, whereas the letter i denotes electric current.

In 1826, when there had been no electrical measuring equipment, Georg Simon Ohm discovered a law applicable to DC circuits. The law was named after him [55], [56]. And in 1893 Charles Proteus Steinmetz proposed his interpretation of Ohm's law in respect to linear AC circuits [57],

Now millions of engineers all over the world use it daily in their practice. According to the symbolic electric circuit analysis method proposed by him, resistance of any LCR-circuit would be measured by complex numbers whose values depend on frequency of voltage applied to an electric circuit.

This makes it possible to carry out a very simple and comprehensible experiment that answers the question whether imaginary numbers are physically real. And all we need for this is to change the frequency applied to a considered LCR-circuit and once again measure the value of current flowing in it. If the value of current does not change, resistances of capacitors and inductors included in the circuit are actually imaginary by its physical nature. And if the value of current changes, then these resistances are imaginary only in name and since they are measurable, they are actually existent. After all, most of what we know about the world around us, we have learned in physics, biology, chemistry and all other sciences particularly with the help of measuring devices. And if we learnt about the world around us directly with the help of our senses and trusted only them, there would be no science.

All engineers who have ever held a soldering iron in their hands know that resistance of LCR-circuits always depends on frequency of voltage applied to them. This dependence is called the frequency response. For many decades, the industry has even mass-produced devices for measuring frequency responses (see fig.1).

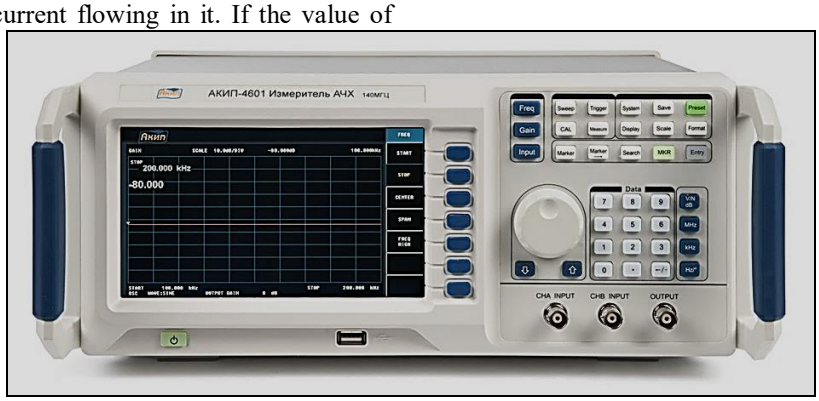

Fig. 1. In any radio engineering laboratory there are devices (one of them is shown in the figure), called frequency response meters, which by their very existence prove the physical reality of imaginary numbers. Thus they prove the incorrectness of the existing version of SRT, and the OPERA and ICARUS experiments at the Large Hadron Collider made it unnecessary

Thus, radio engineering undoubtedly proves physical reality of imaginary numbers and thereby refutes the principle of light speed non-exceedance, and, consequently, the version of the STR presented in all university textbooks of physics.

4. Why did the existing version of STR turn out to be irrefutable?

Despite all the refutations mentioned above, the version of the STR set forth in modern textbooks continues to dominate in physics and is studied even in the most prestigious universities. And involuntarily the question "why?" arises. Why is it that in other sciences one experiment that refutes them is enough for the corresponding hypothesis or theory to cease to exist? .And in physics, SRT, in spite of everything, turned out to be irrefutable. Why did the existing version of STR turn out to be irrefutable?

The answer to this question is obvious - because this version of SRT is in demand. But this answer raises another question - by whom and why is it in demand? And the answer to it is also simple - by relativistic physicists and for career reasons. But it's not entirely obvious.

Then let us remember. At the beginning of the 20th century, the STR was met with hostility. Nobody understood and accepted it, since scientists had previously carried out their research based on classical physics, which even now is much more requested than relativistic physics. However, the STR overcame general scepticism of physics community and began to be studied in textbooks. Now history repeats itself. For more than 100 years of its existence, many studies have been done, many theses have been defended, many articles and books have been published, and many physicists have created their careers on the basis of the STR. Many physicists-relativists have headed academic departments and journal editorial offices. Considering that there is no antimonopoly law in science, but rather competition, physicists have naturally begun to use their position to stifle scientific dissent. Sir Karl Raimund Popper [58] wrote: *"... Struggle of opinions in scientific theories is inevitable and is a necessary prerequisite for the development of science."*

Therefore, in order to answer the question posed in the title of the article, it is necessary to take into account the psychological aspect of the problem of competition in science, which is actually a kind of business. Hans Christian Andersen's fairy tale "The Emperor's New Clothes" perfectly illustrates the paradoxical nature of the solution of this problem in STR. It is clear from the tale that the indisputability of the existing version of the (essentially incorrect) STR was achieved by taking the problem of its existence beyond the bounds of common sense. The same way in Andersen's fairy

tale, in which knavish tailors suggested to the king that he make clothes invisible to the unwise courtiers and visible to the wise courtiers, thereby creating a situation beyond common sense in which:

- courtiers, in order for the king to consider them smart, began to pretend that they see the king's clothes that do not actually exist;
- courtiers who would like to tell the truth about emperor's non-existent clothes knew in advance that they would be regarded stupid;
- thus, the situation forced courtiers to tell a lie for career reasons, and thereby contribute to the successful activities of the swindlers.

And as shown in the monograph of the Nobel Prize winner Sir Roger Penrose "The New Mind of the King" [59], which is an allusion to Andersen's fairy tale, quite recently in computer science it was similarly argued about the inevitability of the emergence of a computer civilization [60]-[64], which over time supposed to enslave people. This witty reception of Sir Penrose was so effective that now no one remembers the possible enslavement of people by computers.

And in the situation considered in the article:

- the physical community now recognizes as "smart" those scientists who understand (and at first no one understood and accepted STR) the generally accepted version of STR and believe it to be unconditionally correct, despite the fact that it is refuted by many well-known physical realities;
- and these "smart" scientists even deliberately created – for example, by the OPERA and ICARUS experiments – an incorrect public opinion about the infallibility of the existing version of STR presented in university physics textbooks, which justified their unsuccessful long-term multi-billion dollar costs for the implementation of erroneous scientific concepts;
- at the same time, scientists who try to criticize the generally accepted version of STR, the physical community creates a dubious reputation and difficulties in creative activity.

Thus, from the set forth it follows that the universally accepted version of STR stated in physics textbooks, as it is incorrect, it is quite possible to call on terminology H. H. Andersen's "New King's Delusion". And in fact this new theory is as non-existent as the king's non-existent new dress. But the physical community, ignoring the physical realities refuting this version of STR, as well as the "clever" courtiers in Andersen's fairy tale praises it. And it is even studied in physics textbooks. Nevertheless, as Hans Christian Andersen argued, "the king is naked" and so the generally accepted version of the STR in physics textbooks must be corrected.

5. Conlusions

Therefore it is time to realize that, despite the great significance for science of the principle of relativism, this principle, due to the lack of the necessary experimental knowledge in the 20th century in the generally accepted version of STR, was incorrectly stated using the incorrect postulate about non-exceeding the speed of light, that replaced this knowledge. And over the past century since creation of this obsolete version of the STR, physics community has canonized it, instead of correcting and developing it further using the alternative version of the STR created in the 21st century [65]-[69]. But Albert Einstein himself does not claim that his version of STO is infallible. He wrote: *"There is no idea in which I am confident that it will stand the test of time"*

Therefore, the conclusion is logical: modern higher physical education is imperfect, because now even in the most prestigious universities students are still being taught knowledge that has already been refuted by modern science.

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References

1. Larmor J.J. (1897). A Dynamical Theory of the Electric and Luminiferous Medium. Part III. Relations with Material Media. Philosophical Transactions of the Royal Society A: Mathematical, Physical and Engineering Sciences. 190, 205-300.

2. Lorentz H.A. (1899). Simplified Theory of Electrical and Optical Phenomena in Moving Systems. Proceedings of the Netherlands Academy of Arts and Science. Amsterdam. 1, 427-442.

3. Poincaré H. (1905). On the Dynamics of the Electron. Comptes Rendus. 140. 1504-1508.

4. Einstein A. (1905). Zur Elektrodynamik bewegter Korper. Annals of Physic. 17. 891-921.

5. Weisstein E.W. (2005). The CRC Concise Enciclopedia of Mathe-matics. 3-rd ed. Roca Raton. FL, CRS Press.

6. Beckmann P. (1976). A History of π. 3-rd edition. St. Martin's Press. NY.

7. Tamm I. E. (1959). General properties of radiation emitted by systems moving at superluminal velocities and some applications to plasma physics. Advances in Physical Sciences. 68(3). 387-396. doi:10.3367/UFNr.0068.195907c.0387

8. Antonov A. A. (2008). Physical Reality of Resonance on Complex Frequencies. European Journal of Scientific Research. 21(4). 627-641. http://www.eurojournals.com/ejsr.htm

9. Antonov A. A. (2009), Resonance on Real and Complex Frequencies. European Journal of Scientific Research. 28(2). 193-204. http://www.eurojournals.com/ejsr.htm

10. Antonov A. A. (2010). New Interpretation of Resonance. International Journal of Pure and Applied Sciences and Technology. 1(2). 1-12. http://doi.org/10.17686/sced_rusnauka_ 2010-888

11. Antonov A. A. (2010). Oscillation processes as a tool of physics cognition. American Journal of Scientific and Industrial Research. 1(2). 342 – 349. doi:10.5251/ajsir.2010.1.2.342.349

12. Antonov A. A. (2010). Solution of algebraic quadratic equations taking into account transitional processes in oscillation systems. General Mathematics Notes. 1(2). 11-16.

http://doi.org/10.17686/sced_rusnauka_2010-887

13. Antonov A. A. (2013). Physical Reality of Complex Numbers. International Journal of Management, IT and Engineering. 3(4). 219-230. http://doi.org/10.17686/sced_rusnauka_2013-898

14. Antonov A.A. (2014). Correction of the special theory of relativity: physical reality and nature of imaginary and complex numbers. American Journal of Scientific and Industrial Research. 5(2). 40-52. doi:10.5251/ajsir.2014.5.2.40.52

15. Antonov A. A. (2015). The principle of physical reality of imaginary and complex numbers in modern cosmology: the nature of dark matter and dark energy. Journal of Russian Physical and Chemical Society. 87(1). 328-355. (in Russian).

http://doi.org/10.17686/ sced_rusnauka_2015-1119

16. Antonov A.A. (2016). Physical Reality and Nature of Imaginary, Complex and Hypercomplex Numbers. General Mathematics Notes. 35(2). 40-63.

http://www.geman.in/yahoo_site_admin/assets/docs/4_GMN-10932-V35N2.31895146.pdf

17. Antonov A.A. (2017). The physical reality and essence of imaginary numbers. Norwegian Journal of development of the International Science. 6. 50-63. http://www.njd-iscience.com

18. Antonov A. A. (2015). Physical reality of complex numbers is proved by research of resonance. General Mathematics Notes. 31(2). 34-53.

http://www.emis.de/journals/GMN/yahoo_site_admin/assets/docs/4_GMN-9212-V31N2.1293701. pdf

19. Antonov A. A. (2015). Ohm's law explains astrophysical phenomenon of dark matter and dark energy. Global Journal of Physics 2(2). 145-149.

http://gpcpublishing.com/index.php?journal=gjp&page=article&op=view&path%5B%5D=294&path%5B%5D=pdf_14

20. Antonov A. A. (2015). Adjustment of the special theory of relativity according to the Ohm's law. American Journal of Electrical and Electronics Engineering. 3(5). 124-129.

doi: 10.12691/ajeee-3-5-3

21. Antonov A.A. (2016). Ohm's Law is the general law of exact sciences. PONTE. 72(7) 131-142. doi: 10.21506/j.ponte.2016.7/9

22. Antonov A.A. (2016). Ohm's Law explains phenomenon of dark matter and dark energy. International Review of Physics. 10(2). 31-35

https://www.praiseworthyprize.org/jsm/index.php?journal=irephy&page=article&op=view&path%5B%5D=18615

23. Antonov A.A. (2016). Ohm's law refutes current version of the special theory of relativity. Journal of Modern Physics. 7. 2299-2313. http://dx.doi.org/10.4236/jmp.2016.716198

24. Antonov A. A. (2021). The special theory of relativity presented in physics textbooks is incorrect. 77 International scientific conference of Eurasian Scientific Association "Theoretical and practical issues of modern science". Moscow. ESA. 11-15. (in Russian)

25. Antonov A. A. (2021). Version of the special theory of relativity that is studied in all physics textbooks is incorrect. Österreichisches Multiscience Journal (Insbruck, Austria). 43(1). 17-22. http://osterr-science.com

26. Antonov A. A. (2021). Generally accepted version of the special theory of relativity contained in physics textbooks is incorrect. The scientific heritage. (Budapest, Hungary). 73(2). 39-43. DOI: 19.24412/9215-0365-2021-73-2-39-43

27. Antonov A. A. (2021). Special theory of relativity, which is studied in physics textbooks, is incorrect. German International Journal of Modern Science. 16, 49-53.

DOI: 10.24412/2701-8369-2021-16-49-53

28. Antonov A. A. (2021). Special theory of relativity, which is studied in all physics textbooks, is incorrect. Danish Scientific Journal. 51(1). 31-35. http://www.danish-journal.com

29. Antonov A. A. (2021). Special theory of relativity taught in all physics textbooks is incorrect. Annali d'Italia. 22(1). 39-44. https://www.anditalia.com/

30. Antonov A. A. (2021). Special theory of relativity presented in physics textbooks is wrong. Norwegian Journal of development of the International Science68(1).3-7.DOI:10.24412/3453-9875-2021-68-3-7.

31. Antonov A. A. (2021). In all physics textbooks an erroneous version of special theory of relativity is given. International independent scientific journal. 31. 34-39. http://www.iis-journal.com

32. Antonov A. A. (2021). Special theory of relativity taught in physics textbooks is wrong. Journal of science. Lyon. 23. 47-52. https://www.joslyon.com/

33. Antonov A. A. (2021). All physics textbooks study incorrect special theory of relativity. Sciences of Europe. (Praha, Czech Republic). 79(1). 30-35.

DOI: 10/24412/3162-2364-2021-79-30-35

34. Antonov A.A. (2021). Experimental proofs of falsity of the version of the special theory of relativity presented for study in physics textbooks and truth of its alternative version. 80 International scientific conference of Eurasian Scientific Association "Development of science and education in the context of global instability". Moscow. ESA. 8-17. (in Russian)

https://esa-conference.ru/sborniki/?y=2021

35. Antonov A. A. (2021). The fallacy of the STR version studied in physics textbooks proved experimentally. Österreichisches Multiscience Journal (Innsbruck, Austria). 45(1). 17-26. http://osterr-science.com

36. Antonov A. A. (2021). Experimental evidences for the fallacy of the STR version in the physics text-books. European Journal of Applied Sciences. Services for Science and Education. UK. 9(6). 349-364. DOI:10.14738/aivp.96.11304.

37. Antonov A. A. (2021). If the STR version in physics textbooks were true, we would never have heard the music of the piano and the bell ringing, there would be no television, no cellular telephony, no radar or GPS navigation, we would not even be aware of the existence of resonance and Ohm's law as interpreted by Steinmetz, and our children could not swing on the swings. The scientific heritage (Budapest, Hungary). 78(2). 41-50.

DOI: 10.24412/9215-0365-2021-78-2-41-50

38. Antonov A. A. (2021). Experimental refutations of the STR version contained in physics textbooks and confirmations of the truth of its alternative version. German International Journal of Modern Science. 22. 52-61. DOI: 10.24412/2701-8369-2021-22-52-61

39. Antonov A. A. (2021). The STR version in physics textbooks must be corrected, because if it were true, there would be no tsunamis or indian summer in nature, we would be never have heard piano music, engineers would be not have been able to create television, cell phones, GPS trackers, and even children would not be able to swing on swings. Danish Scientific Journal. 54(1). 29-38. http://www.danish-journal.com

40. Antonov A. A. (2021). Experimental evidence of the incorrectness of the STR version studied in physics textbooks. Annali d'Italia. 25(1). 32-41. https://www.anditalia.com/

41. Antonov A. A. (2021). The incorrectness of the STR version presented in physics textbooks proven experimentally. Norwegian Journal of development of the International Science 74(1). 3-7. DOI: 10.24412/2453-9875-2021-74-53-62.

42. Antonov A. A. (2021). Experimental refutations of the generally accepted version of the SRT studied in physics textbooks. International independent scientific journal. 34(1). 23-32. http://www.iis-journal.com

43. Antonov A. A. (2021). Rxperimental refutations of the SRT version in the physics textbooks. Journal of science. Lyon. 26(1). 29-37. https://www.joslyon.com/

44. Antonov A. A. (2021). Experimental evidences for the fallacy of the STR version in phisics textbooks. Sciences of Europe (Praha, Czech Republic). 82(2). 19-28.

DOI: 10.24412/3162-2364-2021-82-2-19-28

45. Antonov A. A. (2021). The version of the STR stated in physics textbooks is incorrect, since it denies the existence of radio engineering. 82nd International Scientific Conference of the Eurasian Scientific Association "Scientific results in theory and practice". Moscow. ESA. 11-15. (in Russian) https://esaconference.ru/sborniki/?y=2021

46. Antonov A. A. (2022). The version of STR presented in physics textbooks is incorrect, since it follows from it that radio engineering should not exist. European Journal of Applied Sciences. Services for Science and Education. UK. 10(1). 440-445.

DOI://doi.org/10.14738/aivp.101.2022

47. Antonov A. A. (2022). The existence of radio engineering refutes the physics textbooks' version of STR. The scientific heritage. (Budapest, Hungary). 83(1). 19-22.

DOI: 10.24412/9215-0365-2022-83-1-19-22

48. Antonov A.A. (2022). The fundamental Ohm's law in radio engineering as interpreted by Steinmetz, which proves the physical reality on imaginary capacitive and inductive reactances, refuted the version of the STR presented in physics textbooks even before its creation. German International Journal of Modern Science. 26. 50-53. DOI: 10.24412/2701-8369-2022-26-50-63

49. Antonov A.A. (2022). The version of STR stated in physics textbooks is refuted by the existence of radio engineeng. Danish Scientific Journal. 56. 56-59. http://www.danish-journal.com

50. Antonov A.A. (2022). The version of STR presented in physics textbooks is incorrect because it denies the possibility of the existence of Ohm's law as interpreted by Steinmetz and, consequently, the existence of radio engineering. Annali d'Italia. 28(1), 43-47.

https://www.anditalia.com

51. Antonov A.A. (2022) The version of STR stated in physics textbooks is refuted by the existence of radio engineering. Norwegian Journal of development of the International Science. 78(1). 63-67. DOI: 10.24412/3453-9875-2022-78-63-66.

52. Antonov A.A. (2022). If the physics textbook version of STR were true, then Ohm's law should not exist in nature, and therefore all radio engineering would not exist. International independent scientific journal. 36. 16-19. http://www.iis-journal.com

53. Antonov A.A. (2022). If the version of STR in physics textbooks were true, then there would be no radar, no television, no radio navigation, no telecommunication and many other things. Journal of science. Lyon. 28. 76-79. https://www.joslyon.com/

54. Antonov A.A. (2022). The version of STR set out in physics textbooks is incorrect because it states that Ohm's law as interpreted by Steinmetz does not really exist, and therefore radio engineering does not exist either. Sciences of Europe (Praha, Czech Republic). 87(1). 54-57.

DOI: 10.24412/3162-2364-2022-1-54-57

55. Ohm G. S. (2014). Die galvanische Kette. Verlag Der Wissenschaften. Göttingen.

56. Ohm G. S. (2015). Gesammelte Abhandlungen. Severus Verlag, Hamburg.

57. Steinmetz C. P. (2010). Theory and Calculation of Electric Circuit. Nabu Press. Charlstone. SC.

58. Popper K. R. (2002). Conjectures and Refutations. The Growth of Scienrific Knowledge. London. Routledge.

59. Penrose R., (2016), The Emperor's New Mind: Concerning Computers, Minds, and the Laws of Physics, Oxford University Press, Oxford, UK

60. Vinge V. (1993). The coming technological singularity: How to survive in the post-human era. In VISION-21 Symposium. NASA Lewis Research Center and the Ohio Aerospace Institute. https://www.frc.ri.cmu.edu/~hpm/book98/com.ch1/vinge.singularity.html

61. Moravec H. (1998). When will computer hardware match the human brain? Journal of Evolution and Technology. 1. 1-12. http://www.frc.cmu/edu/~hpm/

62. Kurzweil R. (2005). The Singularity Is Near: When Humans Transcend Biology. Viking: NY.

63. Bostrom N. (2006). How Long Before Superintelligence? Linguistic and Philosophian Investigations. 5(1). 11-30. http://www.nick.bostrom.com

64. Yudkowsky E. (2008). Artificial Intelligence as a Positive and Negative Factor in Global Risk. Singularity Institute for Artificial Intelligence. In Global Catastrophic Risks, edited by Nick Bostrom and Milan M. Ćirković. 308-405. Oxford University Press.

65. Antonov A. A. 2016. What Physical World Do We Live in. Journal of Modern Physics, 7(14), 1933-1943 DOI: 10.4236/jmp.2016.714170

66. Antonov A. A. (2019). The special theory of relativity was not and could not be created in the 20-th century. Journal of Russian Physical and Chemical Society. 91(1). 57-94.

http://www.rusphysics.ru/files/Antonov.91-1.pdf

67. Antonov A. A. 2020. Comparative Analysis of Existing and Alternative Version of the Special Theory of Relativity. Journal of Modern Physics. 11(2), 324-342.

DOI: 10.4236/jmp.2020.11202

68. Antonov A. A. 2021 How to turn human civilization into super civilization. 72 International scientific conference of Eurasian Scientific Association "Modern concepts of scientific research". Moscow. ESA. 3-15. (in Russian) https://esaconference.ru/sborniki/?y=2021

69. Antonov A. A. 2021 Antimatter, anti-space and anti-time. 75 International scientific conference of Eurasian Scientific Association "Strategies for stable development of world science". Moscow. ESA. 1-4. (in Russian) https://esa-conference.ru/sborniki/?y=2021

VORTEX DYNAMICS OF SUBSTANCE IN AN ISOLATED SPHEROIDAL VORTEX AND ITS RELATIONSHIP WITH A CHARGE

Milyute E.,
Milyus A.
IRG "LITAVEM-3", Vilnius, Lithuania
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Abstract

The given work is devoted to the study of vortex processes flowing in the liquid spheroidal vortex leading to appearance of fluxes of a substance, which are responsible for appearance of characteristics (potential and intensities of fields) in space surrounding it. In this work we are developing further the proposed by us new physical conception about a vortical state of a substance in the form of a viscous liquid self-closed spheroidal vortex, that allows us to take a new look at the problems of the existence of different kind of fields of interaction and we elaborate new dynamical theory of emission giving the possibility to have a new look at many processes occurring in Nature. The mechanism of vortex interaction of an emitted matter with the substance in the vortex is also considered.

Keywords: charge, spheroidal vortex, emission, vortex dynamics of substance, circulation, intensity of vortex, vortex interactions, electromagnetism.

1. Introduction

Abdus Salam in 1980 [1] identified the fundamental problem of revealing the essence of the physical existence of charges and their role in interactions. We know that each type of interaction is associated with a certain parameter of the object. In the case of gravitational interactions the mass *m* of a body is said to the basis parameter of interacting bodies. The charge *Q* is being the main parameter, coming out as a means of the main quantity at electrostatic, magnetic and electromagnetic interactions. The reasons of difference of main parameters of separate kinds of interactions are not clear up to now. There are not clear notions about physical essence of a charge and mechanism of its appearing on the surfaces of interacting objects. The elaboration of the concept of the charge stopped on the statement of the fact that it exists in two kinds - positive and negative.

This work is devoted to the consideration of the vortex nature of the charge in various types of interactions, as well as the causes and mechanism of its manifestation in interacting bodies. The analysis showed that each atom of an interacting object should be considered as a "ball-drop" filled with a substance that has its own mass, volume and radius. We will assume that such "balls" have the ability to deform and rotate around their own axis, which is very important for determining the nature of the vortex motion during interaction.

The vortex state of a substance was found by Oersted [2] in 1820, but this fact remained incomprehensible and it is not realized up to now.

Taking into account of the fact found by Oersted in 1820 the simultaneous consideration of equations of forces of interactions by different kinds of interactions - Newton's law for the gravitational interactions, Coulombs's laws for electrostatic and magnetic interactions and also the law for interacting of two currents allows us to determine that all specified kinds of interactions can be leaded to the united hydrodynamic model while the quantity comes out as a basis of a charge being the main parameter of all kinds of interactions

$$\boldsymbol{Q = \sqrt{mv^2r}} \qquad (1)$$

where $\boldsymbol{m}$ is a mass of a substance making up the body of a vortex, $\boldsymbol{v}$ is a velocity of rotation of the mass around own axis, $\boldsymbol{r}$ is the radius of the vortex.

By this, as it is shown from Eq. (1), the velocity of its rotation about own axis contributes to the quantity of a charge for the same mass.

Deducing in Eq. (1) the meaning of area from under the sign of root and taking into account that $\boldsymbol{Q = \Phi = B \cdot S}$, where $\boldsymbol{\Phi}$ is the magnetic flux with the dimension $[M^{1/2} L^{3/2} T^{-1}]$, we get new expression not only of a charge

$$\boldsymbol{Q = r^2\sqrt{\rho v^2}}\,, \qquad (2)$$

but of magnetic induction

$$\boldsymbol{B = \sqrt{\rho v^2}}\,, \qquad (3)$$

where $\boldsymbol{\rho}$ is a density of a substance of a vortex, $\boldsymbol{v}$ is a velocity of its rotating around own axis, $\boldsymbol{r}$ is a radius of the vortex. The quantity $\boldsymbol{\rho v^2}$, standing under the root sigh, is being nothing more nor less than a double dy-namic or impact pressure [3-4], calculated by a para-metric value of the velocity or, in other words, it is a unit element of volume of a substance of the speroidal vortex. In another way, the expressions (2) and (3) show that the charge presents itself the particles – the units of the volume of a substance of the vortex forming the magnetic induction **B**, creating the dynamic pressure. As it is known that div **B** = 0, this fact tells that the same rotating mass of a substance creates the flux $\boldsymbol{\Psi_S}$ of particles of a substance for appearing of the magnetic induction.

On the other hand, if the expression (1) for charge will be presented in the form

$$\boldsymbol{Q = \sqrt{v(mvr)}} \qquad \textbf{(4)}$$

It can be seen that the charge presents itself nothing but the fluxes of mass possessing the action (the fluxes of masses bearing the action).

Thus**,** the charge is the fluxes - the jets of particles – the units of volumes of a substance, possessing the kinetic energy, transferring the action, bearing the an-gular momentums, outflowing as in polar, so in radial directions by different kinds of interactions.

Namely these fluxes of particles emitted by the body outside the limit of its volume that create these characteristics which are accepted be called potentials and intensities of fields, responsible for the interaction between bodies. It is the presence of these particles that makes it possible to consider all kinds of interactions from unified positions **[3-5].**

On the basis of the obtained expression for a charge the gravitational charges Q_G of atoms of the chemical elements of the Periodic Table of Elements of D.I.Mendeleev [5], the values of velocities ($\boldsymbol{v}$) of motion of a substance in atoms (Table 1) and the values of circulation of the velocity of transfer of a substance $\Gamma_{rot} = (v \cdot r)$ in them (Table 2) [4-6]. It is found that of one of basic characteristics of atoms is being the circulation $(v \cdot r)$ of a velocity of transfer of a substance in its volume except mass (Table 2). As it is seen from Table 2, the circulation of a velocity of transfer of a substance in atoms within the period remains constant. Some distinctions in value by period, seemingly, connected with an accuracy of definition of an effective radius of an atom. In the whole, the jump-like change of the velocity of circulation of a substance approximately on average by the same value

$\Delta(\boldsymbol{v \cdot r}) \approx [\boldsymbol{10.7 \pm (0.81 \div 1.5)}] \times \boldsymbol{10^{-20} cm^2 s^{-1}}$

is observed from period to period, remaining a constant value within the period. Table shows also that we should separate the noble gases out into special, Zero, group and to put them at the beginning of a following period. Because of it that the circulation of a velocity of transfer of a substance of this period of elements essentially differs from the circulation of that period, to which they are concerned in present time.

Table 1

Velocities of motion of a substance $\boldsymbol{v \times 10^{-12} cm\ s^{-1}}$ in atoms of elements [5-6]

period	group									
	0	I	II	III	IV	V	VI	VII	VIII	
1		H^1 4.93								
2	He^2 5.53	Li^3 7.04	Be^4 9.45	B^5 11.06	C^6 13.70	N^7 13.94	O^8 17.20	F^9 18.14		
3	Ne^{10} 11.82	Na^{11} 11.58	Mg^{12} 12.98	Al^{13} 14.47	Si^{14} 15.02	P^{15} 16.28	S^{16} 18.49	Cl^{17} 19.93		
4a	Ar^{18} 15.19	K^{19} 13.58	Ca^{20} 15.02	Sc^{21} 17.54	Ti^{22} 19.00	V^{23} 20.53	Cr^{24} 21.23	Mn^{25} 21.91	Fe^{26} 22.53	Co^{27} 23.24	Ni^{28} 23.29
4b		^{29}Cu 23.46	^{30}Zn 23.62	^{31}Ga 23.50	^{32}Ge 23.65	^{33}As 25.89	^{34}Se 27.36	^{35}Br 28.25		
5a	Kr^{36} 21.67	Rb^{37} 19.55	Sr^{38} 21.26	Y^{39} 23.41	Zr^{40} 25.14	Nb^{41} 26.57	Mo^{42} 27.67	Tc^{43} 28.41	Ru^{44} 29.36	Rh^{45} 29.63	Pd^{46} 29.79
5b		^{47}Ag 28.83	^{48}Cd 28.74	^{49}In 28.39	^{50}Sn 30.34	^{51}Sb 30.52	^{52}Te 31.68	^{53}I 32.17		
6a	Xe^{54} 25.84	Cs^{55} 23.49	Ba^{56} 26.19	La^{57} 28.70	Hf^{72} 35.28	Ta^{73} 38.12	W^{74} 38.30	Re^{75} 38.82	Os^{76} 40.73	Ir^{77} 40.79	Pt^{78} 39.45
6b		^{79}Au 38.95	^{80}Hg 39.70	^{81}Tl 37.63	^{82}Pb 36.76	^{83}Bi 41.57	^{84}Po 40.65	^{85}At –		
7	Rn^{86}	Fr^{87} 29.72	Ra^{88} 32.66	Ac^{89} 35.22	Ku^{104}					

Table 2

The circulation of velocity of transfer of a mass $(\boldsymbol{v}\cdot\boldsymbol{r})\times\mathbf{10^{-20}}\boldsymbol{cm^2s^{-1}}$ in atoms of Periodic Table of D.I.Mendeleev [3, 5-6]

Group / Period	v·r middle	0	I	II	III	IV	V	VI	VII	VIII		
1			H 1 2.27									
2	10.74	He 2 8.02	Li 3 10.92	Be 4 10.58	B 5 10.84	C 6 9.73	N 7 11.15	O 8 10.32	F 9 11.61			
3	20.59	Ne 10 18.92	Na 11 22.01	Mg 12 20.77	Al 13 20.69	Si 14 20.73	P 15 20.97	S 16 19.23	Cl 17 19.73			
4a	29.83	Ar 18 29.17	K 19 31.92	Ca 20 29.59	Sc 21 28.42	Ti 22 27.94	V 23 27.51	Cr 24 27.17	Mn 25 27.82	Fe 26 27.49	Co 27 28.12	Ni 28 27.95
4b			29Cu 30.03	30 Zn 30.7	31Ga 32.90	32 Ge 34.05	33 As 32.1	34 Se 32.01	35 Br 31.36			
5a	42.03	Kr 36 42.9	Rb 37 48.48	Sr 38 45.71	Y 39 42.13	Zr 40 40.23	Nb 41 38.79	Mo 42 38.46	Tc 43 38.64	Ru 44 38.17	Rh 45 38.52	Pd 46 39.62
5b			47Ag 41.51	48 Cd 43.39	49 In 44.86	50 Sn 43.39	51 Sb 44.25	52 Te 44.67	53 I 43.75			
6a	53.54	Xe 54 56.34	Cs 55 62.73	Ba 56 58.15	La 57 53.67	Hf 72 56.10	Ta 73 54.13	W 74 53.24	Re 75 53.19	Os 76 53.36	Ir 77 53.84	Pt 78 54.84
6b			79Au 56.09	80 Hg 57.96	81 Tl 60.22	82 Pb 62.50	83 Bi 62.77	84 Po 57.31	85At			
7		Rn 86	Fr 87 83.22	Ra 88 76.75	Ac 89 71.49	Ku 104						

2. The mechanism for the formation of vortex flows of matter that forms the outer shell - the "locking layer" of a spheroidal vortex.

The found expression of charge *Q* allows us to develop the hydrodynamic model of mechanisms of appearing of fluxes of a substance, creating the charge. We will examine it in more detail, qualitatively tracking the change of an internal structure (morphology) of an isolated rotating liquid drop of a substance of an atom placed in vacuum. Practically it is being under action of only forces of a surface tension and by virtue of the fact that in the given case only the spheroid possesses the minimal surface, the drop will have the spheroidal shape, i.e. we will examine the rotating vortex having equal density of a substance.

What is the picture of flows of a substance in the vortex? There is not a direct answer to it and we cannot just make a study of the picture of flows of liquid in the vortex of such size as a nucleus, we will look for analogies. As any vortex, in its central part near axis of rota-tion the "spheroidal" rotating vortex will have a funnel similar one which is in the cavitation bubble (vortex), created in a liquid by irradiating it with ultrasound (Pic. 1).

Pic 1. An one-pole spheroidal vortex (our model).

However, the vortex is filled up with the substance, thus, the internal conic vortex cannot extend over its limits and finishes somewhere within its center. The general picture of current of a liquid in the central conic axial vortex will be analogous to the picture of motion of a liquid in the centrifugal sprayer - the device supplied the outlet of a liquid jet of a flux not only at the axial component of a velocity, but also at radial one, i.e. the liquid flows along the helical lines similar to the vortex, formed in the outflow tube in the bath. The flux getting from the widest part of the vortex tube of the vortex into the narrow cone is speeding up - the equation of the flow rate works:

$$\boldsymbol{\rho\cdot v_{n1}\cdot S_1=\rho\cdot v_{n2}\cdot S_2=Const}\,, \qquad (5)$$

where $\boldsymbol{\rho}$ is a density of a substance, $\boldsymbol{v_n}$ is a translational velocity, S is an area of a cross-section.

The intensity of the vortex cone is expressed by the equation

$$\boldsymbol{\varkappa_S=\Gamma_\xi*\Gamma_\rho=\left(\frac{2\psi_B}{\rho}\right)*\Gamma_\rho}\,, \qquad (6)$$

where you can see the mutual connection between the circulation of the vorticity of the vortex and the circulation of transfer of velocity of a substance in spheroidal vortex. Here, in Eq. (6) the "interaction" between two different circulations $\boldsymbol{\Gamma_\xi}$ **and** $\boldsymbol{\Gamma_\rho}$ follows from the law of conservation of the double mapping of circulation on a straight line, according to the remark of the Norwegian scientist Sophus Lie (our interpretation). According to this equation and the law of conservation

of angular momentum, as the radius of the vortex tube decreases, the tangential velocity also increases inversely proportional to it, i.e. rotation speeds up.

The law of invariability of angular momentum for the spheroidal vortex, the product of the rotation speed $\boldsymbol{v_{rot}}$ by radius *R* according to Helmholtz's second law remains constant from one jet to another, it may be writ-ten down as applied to it

$$\boldsymbol{v_R \cdot R} = \boldsymbol{v_r \cdot r = Const}, \quad (7)$$

The radius of the central vortex filament is small close by the center of the spherical vortex, but the veloocity of rotation of a liquid is big. Bernoulli's equation, connecting the parameters of a jet flowing through a conic central vortex in various cross-section areas will look like this [3-5]:

$$\boldsymbol{P + \frac{\rho v^2}{2} = P + \rho \frac{(v_t^2 + v_{rot}^2)}{2} = P_S = Const}, \quad (8)$$

In this equation the kinetic energy of a liquid adds up from the energy of a translational motion with velocity $\boldsymbol{v_t}$ and the energy of a rotational motion with velocity $\boldsymbol{v_{rot}}$ in the complex motion through a cone of the vortex. The specific kinetic energy $\boldsymbol{\rho v^2/2}$ by analogy with the first term *P* is called a high-speed or dynamic pressure - this energy may turn into pressure at a delay of motion.

It is seen from Eq. (8), that the pressure and velocity in the vortex are "antagonists" and obey the dependence relation

$$\boldsymbol{P \sim 1/v_{rot} \sim 1/r}, \quad (9)$$

If along a flux the velocity $\boldsymbol{v_{rot}}$ rises, then the pressure *P* drops and on the contrary with slowing down of the flux the pressure is raised. With increasing the speed of rotation $\boldsymbol{v_{rot}}$ in the narrow part of the vortex cone the pressure inside it is reduced and, the liquid surrounding the end of funnel is intensively drawn into the canal of a vortex funnel, rising along its walls, forming the counter vortex flux. Hence, the main vortex induces the appearance of the second equivalent vortex, and this leads to the situation, that in the axial part of the rotating spherical vortex two vortex cones directed towards each other, formed by separate vortical fluxes of a substance, sliding one beside another and having the different direction of rotation, are created (Pic. 2).

a *b*

Pic. 2.a) A spheroidal vortex with two opposite poles;
b) the model of a spheroidal vortex with two opposite poles.

If the direction of rotation of the spheroidal vortex corresponding to the rule of the right screw is taken as the main direction of rotation, then the second cone in relation to the first one, which inherits the rotation inherent in the spheroidal vortex itself, will have left-sided rotation. (Pic. 2b, 3). Here, the chiral nature of the vortex is manifested by its internal rotation - confirmation of the existence of the dualistic nature of vortex dynamics of the spheroidal vortex itself [7-8].

Thus, by rotating of the spheroidal vortex here inside it the axial vortex cavity - the core is created, of which along walls two oppositely directed fluxes move. There are these two flows flowing out from the axial regions of the vortex that create two different poles, which we observe at the magnet; in this case, the matter flowing out from one of the cones is being the antimatter in relation to matter flowing out from the other cone. A more detailed description of the vortex structure of the vortex core was given in the works [3-4, 8].

The liquid caught in the vortex funnel, experiencing the accelerating spiral twisting, tends to break away through a narrow nozzle of a funnel outside. Centrifugal forces at the outlet in the region of the critical cross-section, situated in the center of the spherical vortex, form not just another vortex funnel from a flowing out high-speed jet of a liquid. The configuration of another (second) funnel reminds of a socket (bell-like) of one-sheeted hyperboloid [9] (Pic. 5). The speed of rotation and the translational velocity of motion are maximums in the central part of the spheroidal vortex and they noticeable weaken toward its periphery. Here the stream gets broken into separate lines of the current. They form lines of a liquid hyperboloid that create, in their turn, the “flame” of spraying of a substance into separate drops just as how it is going on in a flame of spraying of a centrifugal sprayer in jet engines.

By this, every drop of this jet in this case represents itself the microvortex - magneton. Exactly these microvortices possessing the azimuthal rotation that are responsible for a magnetic rotation of a plane of polarization of light, discovered by M.Faraday in 1845 and which got in science the name of Faraday's effect. Therefore J.Cl.Maxwell had been right when he said, "the discovery of a magnetic rotation of the plane of polarization of light although it did not lead to equally important practical applications, as some of earlier discoveries by Faraday, had for a science the greatest value as it gave the thorough dynamical proof of the fact that wherever there exist the magnetic forces, there is matter, small particles of which rotate around the axes parallel to the direction of this force " [10].

Precisely these jets of matter that create meridional flows of matter are responsible for the magnetic fields not only of separate particles, but also of planets, stars and other objects of the Universe. They also create the surface tension of a liquid spheroidal vortex.

3. Determination of circulation of the general nature of periodic motions of separated jet vortex flows (filaments) carrying a charge *Q*.

The same rotating particles of liquid, microvortices, flying out of the spray cone, due to the Magnus effect, create those closed solenoidal jets of matter - vortex filaments, characteristic of the magnetic fields of permanent magnets (Pic. 3, 4).

$$\Psi_S = \frac{\rho\,\varkappa}{2\,\Gamma}, \qquad (10)$$

where $\varkappa$ is the intensity of the vortex, penetrating its cross section, ρ is a density, Γ – the circulation of the vortex filament [3-6].

At each point of the vortex filament of the outer shell of the spheroidal vortex (red lines on Pic. 3) the total sum of the two flows is

$$\overrightarrow{\Psi_B} = \overrightarrow{\Psi_r} + \overrightarrow{\Psi_\perp} = \frac{\rho}{2}\left(\overrightarrow{\upsilon_r} + \overrightarrow{\upsilon_\xi}\right) \qquad (11)$$

It is shown that the value of the circulation of vortex filaments Γ is directly related to the magnitude of the "vertical" vorticity ζ of the spheroidal vortex itself rotating around its own axis with a speed υ, where the vorticity ζ in Cartesian coordinates is written as

$$\zeta = \vec{k}\cdot\nabla\times\vec{\upsilon} = \frac{\partial\upsilon}{\partial x} - \frac{\partial u}{\partial y} \qquad (12)$$

And considering that here is hidden the special case of description of the vorticity of a vortex filament particle written in its natural coordinates, where the value $\upsilon\kappa_S$ is known as a vorticity twist (curling) at an angle φ according to the law of a curvature vorticity:

$$\zeta_{MP} = \upsilon\kappa_S - \partial\upsilon/\partial n \qquad (13)$$

Thus, for the axisymmetric motion of an incompressible vortex filament, we will have an equation for circulation

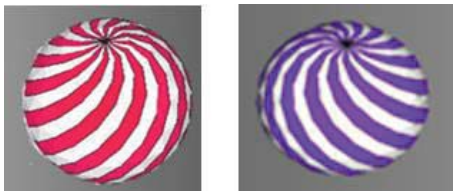
$$u_x\frac{\partial\Gamma_\varphi}{\partial x} + u_r\frac{\partial\Gamma_\varphi}{\partial r} = \left(\frac{\partial^2\Gamma_\varphi}{\partial x^2} + \frac{\partial^2\Gamma_\varphi}{\partial r^2} - \frac{1}{r}\frac{\partial\Gamma_\varphi}{\partial r}\right), \qquad (14)$$

taking into account that $\Gamma_\varphi = Const$, then the solution of this equation leads to the law of change in the specific moment of the microvortex-particle, which is being an element of the vortex filament.

Taking into account the internal rotation of the element of the vortex filament, the law of the total change in the angular momentum of the particle

$$\rho\int\left([\vec{x}\times\vec{u}] + \vec{\xi}\right)dV = \int p[\vec{n}\times\vec{x}]dS \qquad (15)$$

(where *V* is the microvortex volume, *S* is the microvortex cross section, $\vec{n}$ is a normal to the surface) makes a total contribution to the change in the value $\overrightarrow{\Psi_B}$

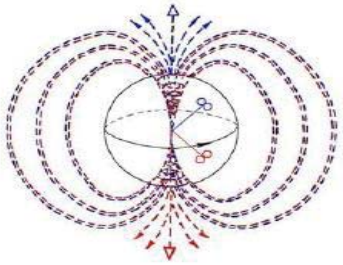


Pic. 3. A spheroidal vortex rotating around its own axis with a right shift (red) and a left shift (blue). [3, 8-9]

4. The mechanism of formation of radial flows of matter in a spheroidal vortex.

How does the source of fluxes of a liquid, moving in radial directions, appear in the center of the rotating spheroidal vortex?

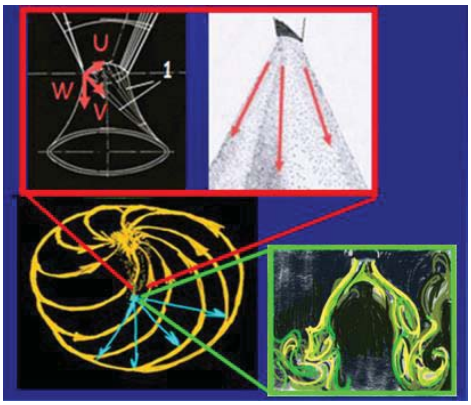
In order to answer to this question we return to the axial conical vortex ending in the center of our rotating spheroidal vortex. The radius of the vortex on the spike of the vortex cone is very small and the speed of rotation is very big. By approaching to the center of the vortex the radius of the vortex cone $r_{cone} \to 0$, and, according to equations of conversation of angular momentum (7) and Bernoulli's equation (8) the speed of rotation tends $\upsilon_{rot} \to \infty$, and the pressure $P \to -\infty$. The mathematics leads to contradiction with physics "to an impossible result": - the appearance of an infinitely largest velocity and an infinitely great and also negative pressure.



Pic. 4.

This cannot be, consequently the picture of phenomenon itself is changed, and a sharp change of a stream occurs. As it is well known, at passing the current, in the equation for the force of interacting currents the coefficient, equal to the speed of light *c* and absent in other equations for forces of interactions, is appearing (Table 1 and 2 in [3-4]). And that coefficient is related to the radial symmetry of an electrical field appearing by passing the current. This fact allows one to say that, when at passing the electric current through an atom, the tangential velocity at the end of a vortex cones reaches the velocity, equal to the speed of light, while the ends of vortex cones become instable. From them the substance begins to break away and in the center of the spheroidal rotating vortex there appears the source of high-speed, high-temperature jets of a substance, moving in radial direction. Moreover, every cone creates the fluxes in an opposite hemisphere (Pic. 2a, 4, 5).

This description is not a fantasy, because, every of us, switching on the electrical lighting in any room, observes such a picture repeatedly and constantly. When the electric current starts to flow along spiral of the electric lamp, of which its atoms are components, being in the gravitational state before that, so they suddenly start to emit the photons to all directions forming in their interiors and flying away with the speed of light.



Pic. 5

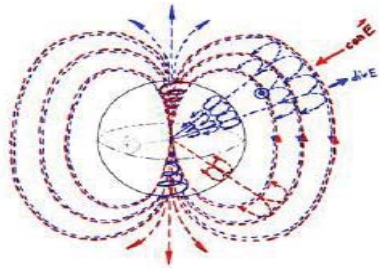
The jet breaking out from the "nozzle" of a cone, inheriting from it the vortex motion, at first behaves as a twisted flooded jet. By this, these ends of the vortex cone, passing through the viscous substance of the vortex, by virtue of the great velocities of circulation of a substance they lose the velocity of the azimuthal rotation and, already at some distance away from the center – the "nozzle" the twisted jet behaves as not twisted. Thus, the convection of a substance of the vortex occurs from its central part to periphery [8-9].

The matter broken away from the cones of rotation, moving in radial direction, has a range of velocities, that, in its turn, leads to a certain spectrum of matter fluxes, possessing various velocities of motion from $v_{Gr} < v \leq c$ (where v_{Gr} is own velocity of rotation of the spheroidal vortex around its axis in a gravitational state), i.e. up to fluxes, possessing velocities equal to the speed of light at the yield from the spheroidal vortex. The part of these hot and high-speed flows - bunches of a substance, having reached colder layers of the vortex, losing the part of their energy, runs along a layer at the velocity equal to their velocity of motion.

Pic. 6

Such a "blocking" stable layer slows down and eventually may stop the motion of the part of the liquid flows, which come to this layer from the central region. The head parts of the infiltrated flux of a substance start to spread along the layer. These jets are similar mushroom thermics floating on from a warmed surface (Pic. 6, 7).

It is not difficult to imagine such a situation, when the spectrum of velocities, emitted by a vortex cone of matter, creates in the body of the spheroidal vortex the stratified shells, between which the convection goes on (Pic. 7).



Pic. 7

The fluxes of a substance of the internal central part of a jet, having a velocity of motion above the velocity of motion of the "blocking" layer, continue their movement to boundaries of the rotating “sphere” itself, after reaching which on its surface they create the hexagonal cells with radial fluxes from the center of the cell to periphery like those, which are characteristic not only for Benard convection, but also arise in "magnetic liquid", situated in the orthogonal field [8-9] and they are well observed on the Solar surface.

The motion of a substance does not be closed at the boundary of the body. The head parts of the fluxes, forming the convective cell, gathered the high velocities of a translational motion in radial direction, come off from the body of the vortex and turn out in the space far from its surface. However, they themselves introduce the fluxes of particles, creating magnetic force lines inherited from the central axial part of the vortex that they cannot be closed at the body of the vortex. Because of this, by its vortex nature (div **B** = 0) and according to Helmholtz's third law for the vortex motion they are closed on themselves.

Pic. 8.

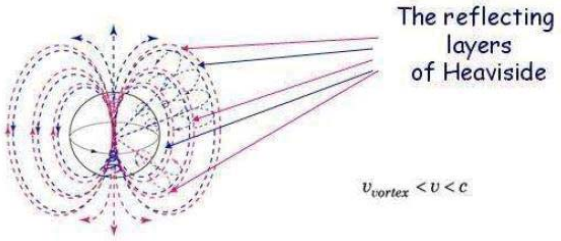
Thus, in space close to the body of the vortex the dynamical structure – the convective cell - the photon like the observed smoke rings (by shape they remind of the convective cell) appears (Pic. 8). In contrast to the convective cell the volumetric frame of the photon is created by meridional magnetic force lines. In the case, if the convective cell flowing out takes away the part of the mass of the central vortex, so as a basis of elements of radiation here the atoms, ions, protons, electrons or other elementary particles may appear, but in contrary to the photon they possess the azimuthal rotation around their own axes already [3, 9].

Every separate part of radially moving particles, having minor azimuthal rotation, will move to their "blocking layer" which is formed at the cost of the spectrum of fluxes of particles creating shells from magnetic force lines around the vortex and which serve for them original "reflecting Heaviside's layers". Losing their own energy and reflecting from them, they begin to turn back. The descending jets of a substance, losing energy and reflecting from their "blocking layers", create those forces (or that pressure), which are responsible for one of mechanisms of attraction both in gravitational

and electromagnetic interactions (Pic. 7, 9), i.e. in the given case the attraction due to outflow of a substance is a convergence:

$$\text{con}\ \mathbf{E} = -\ \text{div}\ \mathbf{E} = -\ \text{div}\left(\frac{Q}{R^2}\right) = -\ \text{div}\left(\frac{r^2\sqrt{\rho v^2}}{R^2}\right) \quad (16)$$

The convergence was created by jets of returning particles, flown out beyond the limits of the spherical vortex and having velocities in a range from $v_{spheroid} < v \leq c$.



Pic. 9. The reflecting layers of Heaviside

Another mechanism of attraction lies hidden in the mechanism itself of interaction of the microvortex with an object, into which the microvortex penetrates at interaction. As regards kinematics of the motion of the microvortex itself in the body of vortex, that it cannot be fixed because of exceedingly high velocity of its motion. However, if consider the data of the experiments of O.Reynolds, investigated in 1876 the resistance of the vortex rings to the motion, who had noticed that they move without resistance, keeping by this own primary impulse [11]. Thus, it is possible to conclude that the microvortex has the mechanism of the motion that is inherent only to it. It lies in that the disturbances produced by the circulation of a substance along the outer shell of the microvortex do not change the structure of that medium, in which the microvortex moves, i.e. when moving not all volume enclosed by the convective cell is transferred, but only the outer shell of the microvortex itself, having a convective structure, is transferred. Moving at the same velocity as the substance in its magnet force lines the microvortex as if it rolled along the line of its motion throwing its substance forward. Its separate jets forming meridional magnetic force lines pass through the medium not changing their primary impulse in this case and, if the microvortex does not enter into the resonance with the medium, through which it passes, thus, if the microvortex is not absorbed by the medium that it passes through one. And, the microvortex having gone out through it that by its return streams, as if it pushed slightly the interacting object in a direction of the object, which emitted it. In this case, it is the line of interaction that is the line of the Least Action fits the straight connecting the interacting objects and that is being the trajectory of motion of the microvortex itself.

5. Conclusions

Thus, all of the above allows us to conclude that:

- different masses of matter in the Universe are characterized by a vortex state;
- in Nature there a single mechanism of vortex interaction exists;
- the vortex mechanism of motion, the nonlinear interaction of meridional flows of matter and azimuthal rotational motions, as well as the direct action of the azimuthal rotation of a spheroidal vortex form the basis of the mechanism for converting the kinetic (mechanical) energy of the vortex central filament into magnetic, electrical and gravitational energy of a spheroidal vortex, i.e. it is being the basis of all physical phenomena observed in Nature;
- the main difference in the strength of interactions is due to the speed of rotation of the interacting objects themselves.

References

1. The Nature of Matter (Wolfson College Lectures 1980) by J.H.Mulvey (1981) Clarendon Press Oxford

2. Oersted J.Ch. (July 21, 1821) Experiments in the Effect of a Current of Electricity on the Magnetic Needle, translation of the original Latin account appearing in Annals of Philosophy, PP. 71-76

3. Milyute E., Milyuvene V., Milyus A.J.V. (2006) Some Questions of Dynamics of Substance in the Spherical Vortex // IUTAM Symposium on "Hamiltonian Dynamics, Vortex Structures, Turbulence", August 25-30, 2006, Moscow, Russia, PP. 116-117.

4. Milyute. E., Milyuvene V., Milyus A.J.V. (2008) The Dynamics of a Substance in an Isolated Spherical Vortex and its Relationship with Radiation // IUTAM Symposium "150 Years of Vortex Dynamics", Lyngby and Copenhagen, October 13-16

5. Milyute E., Milyuvene V., Milyus A.J.V. (2011) Some New Physical Characteristics of Atoms of the Chemical Elements of the Periodic Table of D.I.Mendeleev // XIX Mendeleev Congress on General and Applied Chemistry, 25-30 September, 2011, Volgograd, Russia, Abstract book, V.1, Fundamental Problems of Chemical Science, PP. 288

6. Milyute E., Milyuvene V.A., Milyus A.J.V. (2019) New on the Structure of an Atom in the Periodic System of Chemical Elements of D.I.Mendeleev // XXI Mendeleev Congress on General and Applied Chemis-try, 9-13 September, 2019, Saint-Petersburg, Russia, Book 1: Abstracts, PP. 199

7. Milyute E., Milyus A. (2022) The Relationship of Vorticity and Viscousity Processes of Three Dimensional Swirling Flows // International Scientific Conference "Fundamental and Applied Problems of Mechanics (FAPM-2021)", Moscow, 2-10 December, 2021, Book: The Materials of Conference, Part 1. PP.51-52

8. Milyute E., Milyus A. (2021) Radius-Vector of the Vector Potential and its Essence // LMD LXII Conference in celebration of the 100th birthday of Jonas Kubilius, 16-17 June, 2021, Vilnius Gediminas Technical University, Vilnius, Lithuania

9. Milyute E., Milyus A. (2021) Modeling of Internal Dynamics of Rotating Matter Flows in a Spherical Vortex (our model) // LMD LXII Conference in celebration of the 100th birthday of Jonas Kubilius, 16-17 June, 2021, Vilnius Gediminas Technical University, Vilnius, Lithuania

10. Maxwell J.Cl. (1968) Articles and Speeches, Moscow, Nauka (in Russian)

11. Reynolds O. (1876) On the Resistance Encountered by Vortex Rings and Relation between Vortex Rings and Stream Lines of Disk // Nature. 1876. 14, N. 361, PP.477 - 479.

POLITICAL SCIENCES

FURTHER PROSPECTS FOR THE DEVELOPMENT OF SOCIAL MEDIA IN THE CONTEXT OF POLITICAL COMMUNICATION IN RUSSIA

Eisaev M.B.,
Master's student,
Financial University under the
Government of the Russian Federation
Sukharev M.A.,
Master's student,
Financial University under the
Government of the Russian Federation
Scientific adviser: **Rodionova M.E.**
Candidate of Sociological Sciences, Associate Professor
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Abstract
The article analyzes the social media market in the context of political communications. Social surveys, data on social media coverage, data on the popularity of various topics on different social networks, as well as other digital data obtained from social networks were analyzed. In particular cases related to the blocking of social networks and the creation of domestic analogues were analyzed. The authors concluded that social networks in the Russian Federation will only gain popularity, displacing traditional media. Telegram, being the only major social network that was unblocked after being blocked due to the start of a special military operation in Ukraine, has become one of the main channels of political communication in social media. As a result of the analysis, trends in the social media market in the Russian Federation were highlighted: the decline in the number of available social media, the withdrawal of part of the audience from control, the growth of Telegram as a channel of political communication, turbulence in the social media market in the Russian Federation. Based on these trends, one of the scenarios for the development of social media in the context of political communication in the Russian Federation was suggested.

Keywords: social media, political communications, Telegram, VKontakte, WCIOM, Mediascope.

Traditional media are losing their positions and gradually fading into the background. Thus, according to WCIOM, the consumption of printed products has significantly decreased over the past few years. In 2014, 77% of Russians read printed periodicals, and in 2017 already 55% of Russians. And the share of Russians who would prefer an electronic version instead of a printed one increased from 29% (2013) to 47% (2018), and 46% would prefer printing (from 58% in 2013). [1]

The number of daily Internet users is growing. According to WCIOM data, in 2011 28% of Russians used the Internet daily, and already in 2020 the number of daily users began to reach 69% of Russians. [2] At the same time, the population uses both wired and mobile Internet. Despite the fact that initially the Internet was wired, now a larger number of Russians use mobile Internet, and this is especially clearly seen in the villages. [3]

From 2015 to 2021, according to WCIOM-Sputnik database, the number of people using television as the main source of news about events in the country decreased from 62% to 42%, while the number of people using the Internet (social networks, blogs and news, analytical and official sites) increased from 32% to 41%. At the same time, it is worth noting that the older generations use television as the main source of news, and the younger ones use the Internet. Thus, in the group of respondents aged 45-49, 49% used television, and in the group of 25-34, 60% of respondents preferred the Internet as a source of information.

Social networks and messengers are one of the main sources of information today, especially for the younger generation. For example, according to the Deloitte study "Media Consumption in Russia – 2021", the younger generation tends to receive news on social networks, while older people prefer to receive news from official sources on the Internet.

In addition to analyzing the results of simple social surveys, we will use the results of the study Mediascope which is based not on social surveys like those described earlier, but on analysis using their own measurement tool – «Cross Web». [4] In fact, this is a study of the behavior of research participants on the Internet. A special application collects their Internet activity, while taking into account both mobile traffic (only on Android) and traffic from desktop computers. And, according to their recent research of social media activity in Russia we can have some more detailed information about structure of social media consumption. [5,6]

The beginning of a Special Military operation in Ukraine on February 24, 2022, profoundly affected social media in Russia. Practically all social networks were used to discredit both the armed forces of the Russian Federation and to discredit the government itself, as well as to deliberately spread false information for the psycho-emotional oppression of the population and sowing widespread panic. Each social network reacted

differently to the mass appearance of attempts to misinform the population. VKontakte and Odnoklassniki actively deleted such materials after user complaints, however, platforms such as Facebook and Instagram became mouthpieces of russophobia, allowing not only to publish materials inciting hatred towards Russians, but such materials were also advertised in social networks themselves, so that even a user subscribed only to his friends had every chance to meet with shocking content. In such advertising publications, extreme cruelty towards Russian soldiers was often demonstrated. [7]

Telegram reserves the status of a special media, after the story of its blocking and further unblocking in Russia. Today, in Telegram, you can find a channel with absolutely any agenda, both pro-Russian and pro-Ukrainian, and the state does not pay attention to it. The situation with YouTube is like Telegram's, but there are some nuances, since YouTube blocks official channels associated with the Russian government [8], but there was no reaction to such actions (only statements) from the authorities. YouTube disabled the ability to advertise anything on its site for the Russian audience to suppress the actions that took place on Instagram and Facebook. The social network Tik Tok has solved the problem radically, completely suspending the possibility of publishing new content. [9]

So, according to Mediascope, the average daily coverage of social media has changed as follows (from February 2022 to October 2022): VKontakte – from 38% to 43%; YouTube – from 38% to 41%; Instagram – from 31% to 7%; TikTok – from 27% to 25%; Telegram – from 22% to 38%; Odnoklassniki – from 16% to 16%; Facebook – from 7% to 1%.

It is worth noting quite interesting facts, so, for Telegram, two events became catalysts for audience growth – the beginning of a special military operation in Ukraine and the announcement of partial mobilization in Russia. At the same time, the Telegram audience over the age of 24 is subscribed mainly to news and political channels, the younger audience is subscribed to entertainment channels and news channels related to bloggers. Facebook and Instagram blocking by Roskomnadzor has reduced only the Facebook audience to almost zero, while Instagram remains, albeit with a reduced audience by almost 4 times. However, it is worth noting that after blocking, VPN services have become popular, which make it difficult to obtain reliable data. In YouTube, the structure of search queries by category for October 2022 looks like this: Music – 19%, Entertainment – 18%, Children's – 12%, Videogames – 11%, Serials – 9%, Socio-political – 8%, Cinema – 6%, Shows – 6%.

Almost all the categories were fairly stable during the period from January to October 2022, except for the socio-political category, interest in this category reached high values in March (13%) and in September (9%).

In connection with the above statistics, it becomes obvious that there is a need to study social media both in general and in the context of political communication. This need is especially aggravated due to its constant variability and development. However, despite the decline in the popularity of traditional media among the population, they cannot be completely denied as a channel of political communication since they continue to be effective. [10]

Further we will define some trends in overall development of social media in the context of political communication in Russia:

- **Reducing the number of available platforms**

Instagram and Facebook blocking, the suspension of the publication of new videos in TikTok lead to a reduction in competition in the social media market. There are no popular domestic alternatives other than Facebook. And accordingly, it is simply impossible to organize the transition of the author and his audience to another platform without alternatives. This is one of the reasons why Instagram still has an audience despite being blocked.

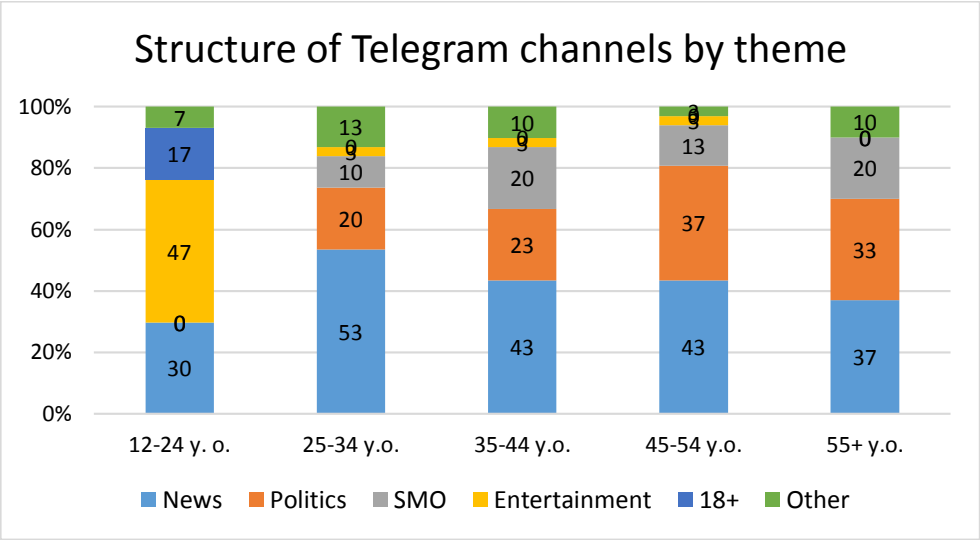
- **The departure of the audience out of control**

Due to the blocking of some social networks, as well as other various news sites, the popularity of VPN services that allowed to bypass the blockages increased many times. Due to the mechanism of VPN, it is much more difficult to determine Russian traffic, both to third-party researchers and to the platforms themselves.

- **The explosive growth of Telegram as a political information channel**

Telegram has long been earning a reputation as an independent platform for communication. As soon as Telegram began to gain popularity among Russian users, it was blocked by a court decision in the spring of 2018. [11] This happened because of the FSB's requirement to provide encryption keys to access user correspondence to combat terrorism and extremism. And there really were prerequisites for this, since the FSB claimed that the terrorist attack in St. Petersburg was being prepared with the help of Telegram. [12] Telegram was building an image of a secure and private messenger, and such conflicts with the authorities only strengthened it. [13] And this image has been strengthening for two years, since Roskomnadzor's attempts to block Telegram blocked everything from the Google search engine to random sites, except Telegram. In 2020, the official departments of the Russian government began using Telegram, for example, the operational headquarters for the fight against coronavirus, to publish official information. And in June 2020, Roskomnadzor announced the lifting of restrictions. [14]

And in 2022, Telegram's coverage has almost doubled. At the same time, the main content in Telegram is news and analytics, and only then entertainment. This can be seen from the structure of the topics of Telegram channels in the Mediascope study.



Pic. 1 – Structure of Telegram channels by theme.

At the same time, it is worth noting that Telegram remains outside the control of the Russian government, at least publicly. It is also necessary to clarify that the category «News» can be equated with «Politics», since Mediascope did not quite correctly define the line between dry news and politics. For example, the channel of the famous blogger «Mir Segodnya with "Yuri Podolyak"» was classified as «News», although the channel is engaged in covering the events of its own, and with their analytics. And the channel «Topor 18+» is engaged in covering events of a domestic scale, unlike the channels «Live Broadcast» or «Before everyone. Well, almost».

- **Turbulence in the social media market in Russia**

The overflow of a part of the audience from blocked platforms to Vkontakte gave the platform more resources for internal development, besides, Vkontakte itself encouraged the transition of authors to itself. Instagram and Facebook blocking messages were accompanied by various statements about the creation of domestic alternatives. The Yappy analogue of TikTok turned exactly one year old on December 2, but the indicators of social activity, in the form of views, likes, comments, are several times lower than even TikTok, which is in anabiosis. The situation with the analogous applications of Instagram - YARUS and Now is similar.

The problem with domestic analogues is that it is more convenient and more profitable to use methods of bypassing blockages. The end user is primarily interested in the diversity of content, and the author is interested in the number of subscribers. Both are available in blocked social networks, even though they are blocked. At the same time, domestic applications do not attract people due to the small number of authors. In fact, this is a vicious circle: no readers – no authors – no content – no readers. Against this background, there is an opportunity for the growth of domestic platforms, with proper promotion and sufficient funds.

But in the social media market in Russia, YouTube and Telegram are literally a wall, which are not under Russian jurisdiction, and as a result, have the opportunity to violate Russian law and not be responsible for it. YouTube removes channels associated with the Russian government, for which there were threats of blocking, but the service is still available, and there are no plans to block it. However, apparently, due to the fact that political content is popular there only due to high-profile events, and the rest of the time YouTube is used as an alternative TV, blocking will not follow.

Based on the above trends, an approximate scenario can be assumed for development of social media in the context of political communication. Telegram – candidate for monopolization of the market of political communications in social media in Russia. According to TGstat, Telegram now has 945 political channels (from 10,000 subscribers) in the Russian segment with a total audience of 62 million people, on average, the channel has 65 thousand subscribers. [15] According to the Medialogy, in August 2022, in the top 20 Telegram political channels by views 11 of them were channels of the officials or journalists of traditional media. [16] VKontakte cannot boast of this, often the pages of officials in VKontakte are maintained by their teams, and not by them personally, which leaves an imprint on the audience's desire to follow such pages.

Telegram has taken a special role in political communication in modern Russia, primarily because of its nature, which combines both a messenger and an aggregator of news and opinions. VKontakte could not occupy such a niche, due to the peculiarities of the algorithms for forming the news feed. Elite communication takes place in Telegram, so, one example of such is the criticism of the General staff of the armed forces of the Russian Federation by Ramzan Kadyrov [17]. It is worth noting that the article on RBC refers specifically to the publication in the Telegram channel.

Telegram channels can be news sources for other media, while the channel itself does not have to be authorized [18]. This entails unpredictable consequences, since even in the top 20 channels of the political Telegram, you can see anonymous channels spreading false information to a wide audience (for example, the Telegram channel "General SVR"). Telegram has not become, and is unlikely to become, a mass media outlet for the whole country or even for most of it in the near future. First, this is due to the fact that, despite the large

number of Telegram users, not everyone reads Telegram channels, this can be seen based on the number of subscribers and views of Telegram channels. However, as a means of political communication, Telegram proved to be successful.

In addition, Telegram for an ordinary user is a source of some specialized knowledge that is not available in ordinary social media. Various channels telling about the "secrets of the Kremlin" or simply analyzing the current situation attract readers. Oleg Lyakhovenko in his article «Telegram Channels in the System of Expert and Political Communication in Modern Russia» concludes that: "Despite the objective predominance of manipulative content, telegram-channels form a special expert ecosystem, a kind of "distributed think tank" which analyses Russian internal political and international agenda in real time" [19].

However, Telegram also has disadvantages, for example, the president of the communication holding "Minchenko Consulting" Evgeny Minchenko concludes that the future of Telegram belongs to authorized, not anonymous Telegram channels [20]. But Eugene Stulova, the executive director of «Minchenko Consulting», in her work "The Four Horsemen of the Information Apocalypse" talks about the phenomenon of a new reality in which trust by an anonymous source of information literally turns this information into true: "Another phenomenon of the new reality is the trust in anonymous sources of information. An example of this is the Telegram messenger channels. Anonymous authors publishing allegedly insider information cannot be verified, however, they acquire hundreds of thousands of subscribers, the media begin to refer to them — as a result, they leave the virtual space and begin to live in the real one" [21]. And at the moment, a fairly significant part of Telegram is occupied by anonymous channels, and because of Telegram's foreign jurisdiction, the authors of such channels remain unpunished for Russian justice.

VKontakte remains a platform primarily for entertainment content, just like YouTube. However, due to the fact that the authors of these platforms have a much greater credit of trust among the audience due to the fact that they are often not anonymous, as in Telegram, they also have a certain potential for political communication. In addition, VKontakte allows you to launch various advertising campaigns with the possibility of accurate targeting, when Telegram targeting is extremely inaccurate, and YouTube advertising is disabled. In addition, back in 2017, it was noted that the popularity of VKontakte as a political communication channel is growing rapidly, both from the electorate and from political PR specialists [22].

The localization of social media, and as a result, the displacement of some authors and their audience from the media space, due to the application of various laws related to fakes, discrediting of the Armed Forces of the Russian Federation, LGBT propaganda, foreign agents, etc., will not lead to the purification of the Russian information space. The situation will only worsen, because virtual enclaves of people of different views, incompatible with the law, but living on the territory of the Russian Federation, will be created due to the availability of tools to bypass the blocks.

It seems quite real that there will be no appearance of a domestic analogue soon, since those analogues that exist now are uncompetitive, despite the blockages. The case with Rossgram, which was promised to launch on March 28, spoiled the reputation of analogues, but now it is still in development. And the launch of analogues while there is an access to their originals is initially a losing strategy since the clone will always be in the role of catching up. However, the emergence of a new social network offering a unique way to communicate is quite realistic.

References

1. WCIOM. The Age of Digital Media: Paper versus Screen: https://wciom.ru/analytical-reviews/analiticheskii-obzor/epokha-czifrovykh-media-bumaga-protiv-ekrana
2. WCIOM. Life online: consumption, use, entertainment: https://wciom.ru/analytical-reviews/analiticheskii-obzor/zhizn-onlain-potreblenie-polzovanie-razvlechenija
3. WCIOM. The Internet as a sphere of Russian human habitation: https://wciom.ru/analytical-reviews/analiticheskii-obzor/internet-kak-sfera-obitanija-rossiiskogo-cheloveka
4. Mediascope. Mediascope has launched a new Internet measurement project - Cross Web: https://mediascope.net/news/1434615/
5. Mediascope. Social Media: https://mediascope.net/upload/iblock/5ab/8bh9sab0ioqdvufiv52lhw3ccruhq585/%D0%9D%D0%A0%D0%A4_SocialMedia_%D0%A1%D1%83%D0%B0%D0%BD%D0%BE%D0%B2%D0%B0_11.11.22.pdf
6. Mediascope. Media audience https://mediascope.net/upload/iblock/d6a/qqk514ramn101f86r82qt9o9e91fl ihp/%D0%9D%D0%B0%D1%82%D0%B0%D0%BB%D1%8C%D1%8F%20%D0%91%D0%BE%D1%80%D0%BE%D0%B7%D0%B4%D0%B8%D0%BD%D0%B0_Mediascope_011222.pdf
7. RIA News. Instagram has been blocked in Russia: https://ria.ru/20220314/instagram-1777974202.html
8. RBC. Google blocked the Federation Council channels on YouTube: https://www.rbc.ru/politics/18/10/2022/634e5a889a79470dcacd7a87
9. Kommersant. TikTok banned streaming and uploading new content to users from Russia because of the law on fakes: https://www.kommersant.ru/doc/5249513
10. Nigmetov A. S. (2021). Social media in political communications. Communicology: Electronic Scientific Journal, 6(4), 41-51.
11. RBC. Why the authorities decided to unblock Telegram. The main thing: https://www.rbc.ru/technology_and_media/18/06/2020/5ee211609a79473d9eccbc4c

12. RBC. The FSB announced the preparation of a terrorist attack in the St. Petersburg metro using Telegram: https://www.rbc.ru/politics/26/06/2017/595096cd9a794764bd8674c5

13. GQ. How Pavel Durov came up with Telegram and why you should not trust the messenger: https://www.gq.ru/heroes/rozenberg-telegram

14. Roskomnadzor. About Telegram Messenger: https://rkn.gov.ru/news/rsoc/news73050.htm

15. TGStat. Telegram channels search: https://tgstat.ru/channels/search

16. Medialogia. Political Telegram Channels: August 2022: https://www.mlg.ru/ratings/socmedia/telegram/11474/

17. Kadyrov linked the withdrawal of troops from the Estuary with "army nepotism": https://www.rbc.ru/politics/01/10/2022/6338496c9a794741143b8966

18. "Polituprava": Russia recognizes LDPR in case of aggression by Ukraine: https://regnum.ru/news/polit/3509377.html

19. Lyakhovenko, O. (2022). Telegram Channels in the System of Expert and Political Communication in Modern Rus-sia. Galactica Media: Journal of Media Studies, 4(1), 114-144. https://doi.org/10.46539/gmd.v4i1.230

20. Novye Izvestia. Evgeny Minchenko: "Telegram is already competing with TV": https://newizv.ru/interview/07-11-2017/evgeniy-minchenko-v-rossiyskih-kommunikatsiyah-telegramm-uzhe-konkuriruet-s-televizorom

21. Eugene Stulova (2021). The Four Horsemen of the Information Apocalypse: a brief guide to reputation management policy in the new information reality. ISBN: 9785907470613

22. Ermolaev V. P. (2017). The VKontakte social network as a modern channel of political communication. Society and power, (3 (65)), 63-73.

TECHNICAL SCIENCES

NANOMODIFICATION OF WELD METAL DENDRITE STRUCTURE

Holovko V.
Paton Electric welding institute, Kyiv, Ukraine
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Abstract
The shape of dendrite grains in low-alloy steel submerged-arc weld deposits has been examined; it is found that the dendrite grain morphology can be modified because of dispersed refractory inclusions inoculation in the weld pool. Influences of inoculated inclusions on dendrites grain size are also discussed. An increase in the dendrite size has been found to increases content of toughness ferrite structure in weld metal.
Keywords: steels; weld metals; microstructure; transmission electron microscopy; dendrites size modification; dispersed inoculates.

1. Introduction

Rolled steel remains the main material in the manufacture of welded metal structures and will maintain its position in this area in the near future. The constantly growing requirements for the reliability and performance of structures, combined with the need to reduce the costs of their manufacture, have caused an intensive growth in the use of innovative solutions in steel rolling production. Modern low-alloy high-strength steels have a submicron or micron structure, which ensures their high service properties, however, practice has shown that the technology complication for the production of rolled products causes an increase in the number of problems arising during its welding.

The weld metal structure formation begins during the crystallization of the weld pool from the base metal partially melted grains boundaries, but in this process the principle of heredity is violated. So, for example, when welded metal with a grain size up to 10 microns, a weld metal is formed with the grain size up to 100 microns or more. This discrepancy is due to the fact that during the rolling process, the steel billet undergoes the most complex thermomechanical treatment with different reheating regimes and the cyclicity of applied forces in order to obtain a fine-grained structure. The weld metal is formed as a cast metal that does not undergo such processing, therefore, other technological methods are required to refine its structure. To refine the structure of the low-alloy steels weld metal, in addition to varying the parameters of the welding process, alloying, microalloying and modification technologies are traditionally used.

Appearing at the end of the of the last century 50s years, with the entry of high-strength low-alloy steels into the rolled metal market, these technologies developed and improved until recently, however, today they have significantly exhausted their capabilities. As practice has shown, an increase in the alloying level leads to a decrease in the plasticity and toughness of the metal, and an increase in the content of modifiers can lead to embrittlement of grain boundaries. Further development requires the use of new technologies for the formation of the weld metal fine-grained structure.

Traditionally, for these purposes, modification processes are used, which are well studied, described in detail (for example, in monograph [1]) and are widely used in practice. The development of the using equipment resolving possibility for metallographic research has contributed to the growth of publications in the of nanomaterials and nanotechnology field, including nanomodification [2-5].

Modification processes make it possible to change the size and shape of primary crystals, and studies carried out in recent years [6-10] have shown that the use of nanotechnology based on the physicochemical features and surface properties of powder materials can have a significant modifying effect due to the high specific nanomaterials surface area. nanoparticles high energy activity.

Based on the differences in the hydrodynamic conditions in the weld pool from the metal melt during steel smelting, the main possibilities of the weld metal dendritic structure formation are associated with the presence of high-speed convective flows at the crystallization front, thermocapillary motion in the interdendritic space and the value of interfacial tension at the boundary of the growing dendrite with the metal melt. While the first two factors can be influenced by changing the welding process parameters, the last largely depends on the surface-active refractory compounds presence in the molten metallayer ahead of the growing dendrite front.

To increase the effectiveness of this effect, the refractory particles size should correspond to the growing dendrite tip size. In the process of pool crystallization duringlow-alloy high-strength steels welding, dendrites with a 30–40 μm size are formed. Such dendrites surface are new growth initiation centers (branches of the second order) with a about 10 μm size appear [11]. The introducing efficiency refractory particles into the weld pool (inoculating) depends on their size, since too small particles, due to the high intensity of their dissociation in the melt, may not affect the crystallization of the metal, and too large can manifest themselves as large non-metallic inclusions [5]. To select the optimal size of inoculants, it is necessary to determine the possible lifetime of dispersed particles in the metal melt, i.e. the time during which they can influence the weld metal crystal structure formation.

2. Experimental details

To perform calculations, we will use the methodology proposed in [12]. When welding low-alloy steels, much attention is paid to the influence of non-metallic

inclusions containing titanium or zirconium compounds on the structure and properties of the weld metal; therefore, we will consider the possibility of using some refractory titanium and zirconium compounds as dispersed inoculants. Physical-chemical characteristics of usinginiculants are given in Table 1.

To carry out thermodynamic calculations, a scheme was adopted, according to which a transition layer is formed around a refractory inclusion with radius r_0 located in a steel melt, containing [i] the elements of the inclusion. The time of complete the inclusion dissociation t is calculated from the expression

$$= \frac{^2_0}{2}$$

where A_i and A_B are the atomic masses of the element included in the inclusion and inclusion; $[i]_o$ and D_i are the content of the element in the metal melt and the coefficient of its diffusion in this melt; ρ_B - inclusion density.

Table 1

Parameters	Magnitude
Steel density, kg/м^3	$7\cdot10^3$
TiC density, kg/м^3	$5{,}4\cdot10^3$
TiN, density kg/м^3	$5{,}4\cdot10^3$
TiO_2, density kg/м^3	$4{,}25\cdot10^3$
Ti content in the weld metal, %	0,04
C content in the weld metal, %	0,07
N content in the weld metal, %	0,01
O content in the weld metal, %	0,06
Diffusion coefficient Ti in steel, м^2/s	$8\cdot10^{-9}$
Diffusion coefficient C in steel, м^2/s	$7{,}9\cdot10^{-9}$
Diffusion coefficient N in steel, м^2/s	$3{,}8\cdot10^{-9}$
Diffusion coefficient O in steel, м^2/s	$4{,}5\cdot10^{-9}$

According to the data given in the literature [13], the weld pool lifetime, depending on the welding mode parameters, can range from 2 to 15 seconds. Table 2 shows calculating results the time required for complete inoculants dissociation in the steel melt in the absence of stirring.

Table 2

Inoculant	Time required for complete dissociation(s) inclusions with size, mkm									
	1,0	2,0	5,0	10	20	40	80	120	160	200
TiC	0,05	0,21	1,34	5,35	21,40	85,61	342,46	770,53	1369,8	2140,4
TiN	0,01	0,06	0,35	1,40	5,60	22,40	89,61	201,62	358,4	560,1
TiO_2	0,03	0,13	0,83	3,33	13,32	53,29	213,15	479,59	852,6	1332,3

Intense flows of molten metal in the weld pool, with the speed magnitude higher than the welding speed [13], significantly increases the rate of particle dissociation. Estimated calculations performed according to the method [12] show that the dissociation processes activity in this case can increase by two orders of magnitude compared with stationary conditions.

Based on the result of the performed calculations, the following conclusions can be drawn: firstly, in order to preserve inoculants as active influence centers on the weld pool metal crystallization processes, it is advisable to introduce them in the form of refractory crystalline compounds with a size at least 0.2 mm (200 μm); secondly, the TiN compounds use for these purposes does not allow achieving the set goals, since inclusions up to 50 μm in size almost completely dissolve in the steel melt, and the presence of larger inclusions in the weld metal structure can cause a decrease in the level of their plasticity and toughness.

During the solid phase growth in the metal melt at the interface, a metal layer is formed with an increased content of liquidating elements, which determines the energy of interphase interaction at the “liquid - solid” interface, and, consequently, the supercooling amount and the crystallization rate, in accordance with the expression

$$\Delta = \frac{- \cdot}{\cdot \cdot},$$

where $\sigma_{l\text{-}s}$ is the value of the interfacial tension at the “liquid - solid” interface, T_l is the liquidus temperature of the metal melt, r is the critical radius of the solid phase nucleus, ρ□and q_s are the density and specific heat of the metal crystallization. Upon contact of a refractory inclusion with the growing dendrite boundary the composition of the boundary layer changes due to enrichment in the inclusion dissociation products, which can be described by the expression

$$\Delta = \frac{_0(1-\ )}{},$$

where *m* is the tangent of the alloy liquidus line slope, C_0 is the initial impurity content in the melt, *k* and *D* are the distribution and diffusion coefficients of the impurityin the melt. By changing the interfacial tension at the “liquid - solid” interface, inclusions can affect the growth rate and morphology of dendrites in the solidifying metal, and the closer the sizes of the dendrite growth initiation centers and non-metallic inclusions are, the more noticeable this effect will be.

In a fundamental review of the processes of forming the metal structure of weld seams [14], it was shown that the modifying effect of inoculants critically depends on the size of the modifier particles and the time of residence in the liquid metal of the welding bath. The importance of the energy of the catalyst/metal interface in controlling the effectiveness of materials as catalysts for crystal nucleation from the melt was shown, and it was also established that an effective catalyst must have a close structural connection with the metal.

Non-metallic inclusions cause significant damage (such as surface and internal defects) in steel products and can reduce the strength and toughness of welded joints, but the addition of certain elements has a modifying effect to suppress the columnar grain structure of cast steel.

Titanium is one of the most effective alloying elements that improves the mechanical properties of materials in steelmaking and welding metallurgy. It is known that Ti-containing phases, such as TiC, TiN, Ti(CN), TiOx, and MnTiOx, can inhibit grain growth due to the Zener pinning effect, leading to the formation of more dispersed metal grains, and can also act as nucleation centers for acicular ferrite morphology.

The work [15] shows the effectiveness of steel modification with titanium and TiC particles dispersed in the melt.

When choosing the type of inoculants for research, they proceeded from their surface activity when interacting with an iron-based melt. The size of the inoculants was chosen taking into account their subsequent dissolution in the molten metal of the welding bath. Based on the data on the physicochemical parameters of refractory compounds, given in the table. 2.34, TiC and ZrO_2 were chosen for further experiments as materials with the highest liquid iron wetting angle.

Physical and chemical characteristics of refractory inoculants [16]

Type of inoculant	Melting point, T_m, °C	Surface tension of the liquid phase σ_1, mJ/m^2	Marginal wetting angle θ, degree	Adhesion work Wa, mJ/м^2
TiC	3260	1780	125	760
TiN	2930	1780	132	590
SiC	2730	1780	82	2030
TiO_2	1843	1780	≈ 0	3560
Al_2O_3	2044	1785	40	3155
ZrO_2	2715	1785	102	1020

2.1. Weld preparation

For investigation possibility modification weld metal structure with nanosize inclusions, the weld metals were obtained by high-strength low-alloy steel arc welding with the refractory non-metallic inclusions introduction into the weld pool. Studies were carried out on deposited metal samplesobtained without introducing nanomodifiers (weld NM-0) and with introducing refractory compounds of titanium carbide (weld TiC) and zirconium oxide (weld ZrO_2). Zirconium oxide and titanium carbide particles up to 200 μm in size were introduced through a flux-cored wire, which was fed into the weld pool in the form of an additive. Chemical composition of welded metals are show in table 3.

Table3

Chemical composition of weld metals

Weld№	C	Si	Mn	S	P	Ni	Mo	Al	Ti	Zr
NM-0	0,050	0,290	1,32	0,024	0,014	2,19	0,27	0,039	0,019	н/о
ZrO_2	0,053	0,138	0,94	0,020	0,024	1,55	0,23	0,021	0,005	0,06
TiC	0,046	0,340	1,39	0,021	0,019	1,70	0,24	0,033	0,011	н/о

2.2. Quantitative metallography

In Fig. 1 shows the structure of weld metal samples. Metallographic studies using transmissio electron microscopy, performed by DSci Markashova L.I. on a JEM-200 CX device (JEOL company) at an accelerating voltage of 200 kV, showed that the introduced dispersed inclusions, firstly, do not dissociate completely in the liquid metal, and, secondly, they are located at the grain boundaries of the secondary structure.

When dispersed refractory compounds with a size of not more than 200 μm were introduced into the weld pool, corresponding compounds with sizes ranging from 30 to 100 nm were revealed at the grain boundaries of the secondary structure, which indicates afairly high resistance of these inclusions both in liquid and solid steel solutions.

To clarify the question of these inclusions possible influence on the dendritic structure, we investigated the weld metal primary structure on polished samples etched in a boiling saturated solution of sodium picrate in water. The microstructure of the last passin a multipass weld (cast structure) was investigated. The samples were cut in a direction perpendicular to the weld longitudinal axis, so that dendrites were visible on the surface section. The dendrites grew in greatest thermal gradient direction in the weld pool. The study of the primary structure according to the images obtained by the optical metallography method was arried out by Ph.D. Ermolenko D.Yu. using a NEOPHOT 30 optical microscope. The results of the columnar dendrites dimensions (dimensions λ) are show in Fig. 2.

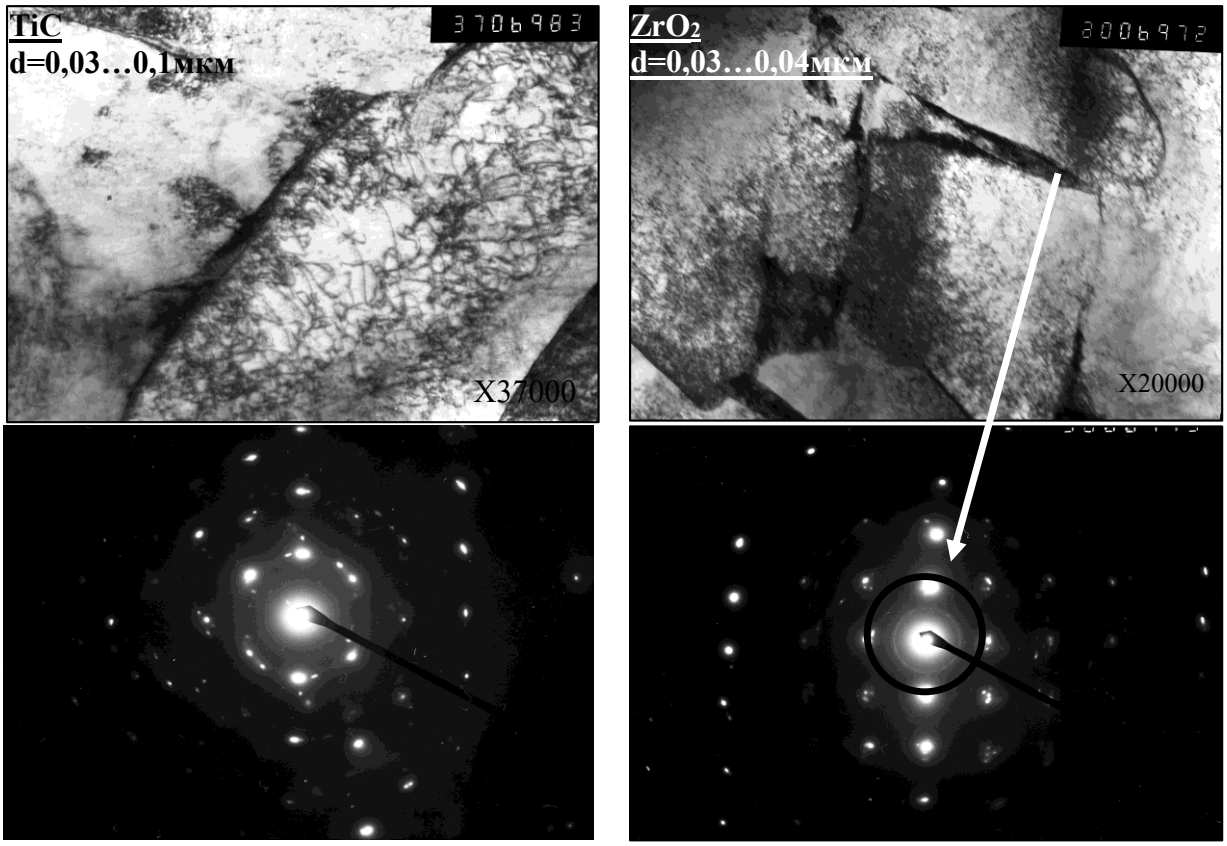
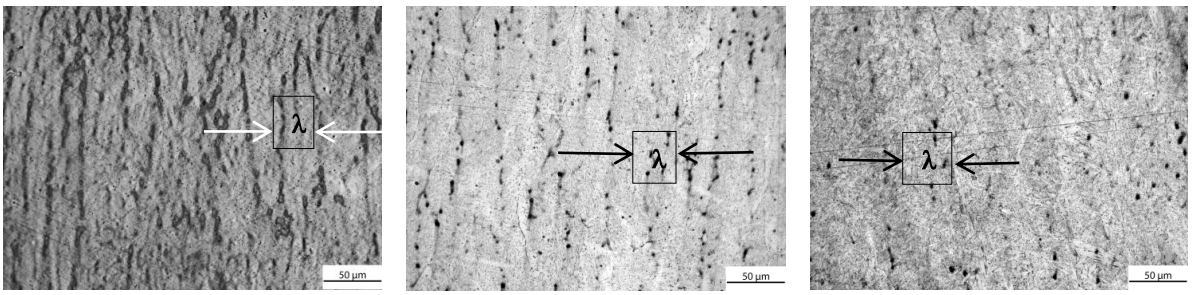


Fig. 1. Fine structure of weld metal

3. Results and discussion

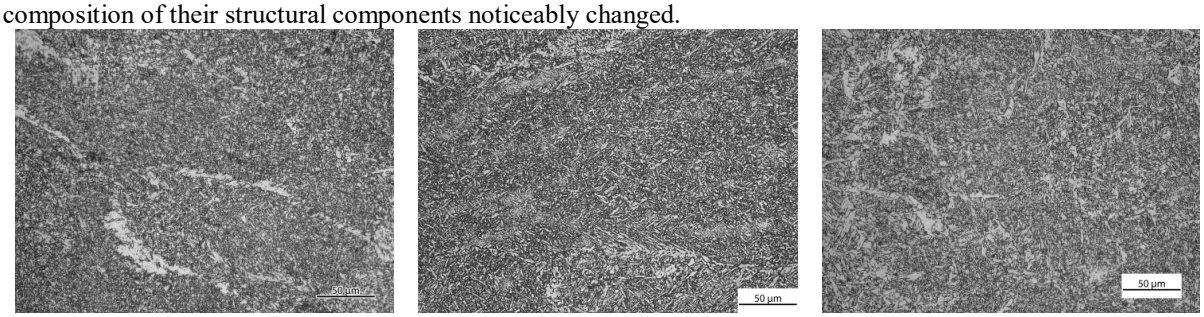
The results of the analysis showed that the presence of nanosized refractory compounds in the weld pool has a modifying effect on the dendrites size. If in themetal with nonmodification(welds NM-0) the average dendrites width was 25 μm, then, as a result of the introduction of nanosized compounds of titanium carbide (TiC weld) and zirconium oxide (ZrO_2 weld), the average dendrites width increased to 44 and 37 μm, respectively.



Weld metal NM-0 Weld metal TiC Weld metal ZrO_2

Fig. 2. Dendritic structure of weld metals

The change in the of dendrites morphology affected on the secondary structure formation (Fig. 3, Table 4) and the weld metal mechanical properties level (Table 5). From the data given in Tables 4-6, it can be seen that the introduction of nanomodifiers practically did not affect the chemical composition of the weld metal, while the composition of their structural components noticeably changed.



Weld metal NM-0 Weld metal TiC Weld metal ZrO_2

Fig. 3. Secondary structure of weld metal

An increase in the size of dendrites, noted as a result of titanium carbide and zirconium oxide compounds introduction into the weld pool, is accompanied by a change in the ratio between the content of upper (B_u) and lower (B_l) bainite while maintaining the proportion of martensite (M) and allotriomorphic ferrite (F). As a result, both the plasticity and the toughness of the weld metal increase (Table 5).

Table 4

Weld №	Content (%) in microstructure of weld metals			
	B_l	B_u	M	F
NM-0	25	60	10	5
ZrO_2	65	20	10	5
TiC	50	30	10	10

Table 5

Weld №	σ_B	$\sigma_{0,2}$	δ	ψ	KCV, J/cm^2 at T, ^{0}C			
	MPa		%		+ 20	0	– 20	– 40
NM-0	788	739	11,4	35	60	58	57	52
ZrO_2	645	556	21	60	116	96	98	82
TiC	728	665	19	61	82	72	63	52

This work did not consider problems related to the technology of modifiers inoculation into the weld pool, the choice of their type, size and content. These problems are related to the topics of forthcoming research. The purpose of this work was to demonstrate the possibilities of using refractory dispersed inclusins for nano-modification of weld metal.

Conclusions

Research has been carried out to determine the possibility the dendritic structure nano-modification of the low-alloy steels weld metals by inoculating dispersed refractory joints into the weld pool. As a result of the work performed, it was found that

1. Taking into account the thermodynamics and kinetics of non-metallic inclusions dissolution in the weld pool, the optimal size of inoculants is within 200 - 500 □m. Smaller inclusions have a high tendency to dissolve in the metal melt before the start of the crystallization process, while larger ones can serve as a source of weld metal brittle fracture.

2. It has been shown that inoculated inclusions are present in the weld metal structure in the form of interlayers with 30 to 100 nm thicknesses at grain boundaries, which indicates a sufficiently high resistance of these inclusions both in liquid and solid steel solutions.

3. It has been established that the inoculation of dispersed refractory inclusions into the weld pool can have a modifying effect on the dendrites formation.

4. Changes in the width of dendrites, wich grew during metal crystallization, affect the conditions for the secondary structure formation and the level of weld metal mechanical properties.

References

1. Гольдштейн Я.Е., Мизин В.Г. Модифицирование и микролегирование чугуна и стали. - М.: Металлургия, 1986. - 272 с.: Ил. 127, Табл. 23, Библиогр.список: 232 назв.

2. Hashimoto M. Advances in nano-level materials characterization technology – Nippon steel technical report – 2005 - v.91, #1, p.2-6.

3. Suito H., Ohta H., Morioka S. Refinement of solidification microstrucure and austenite grain by inclusion particles – ISIJ International, 2006 -v.46, #6, p.840-846.

4. Давыдов С.В. Наномодификатор как инструмент генной инженерии структурного состояния расплава чугуна – Сб. докладов Литейного консилиума №1 «Модифицирование как эффективный метод повышения качества чугунов и сталей» - Челябинск: Челябинский Дом печати. 2006 – с.40.

5. Рябцев И.А., Кондратьев И.А., Гадзыра Н.Ф. и др. Влияние ультрадисперсных карбидов в порошковых проволоках на свойства теплоустойчивого наплавленного металла – Автоматическая сварка – 2009, №6, с.13-16.

6. Модифицирование сталей и сплавов дисперсными инокуляторами/ Сабуров В.П., Еремин Е.Н., Черпанов АН., Миннеханов Г.Н– Омск.: изд. ОмГТУ, 2002.- 257с.

7. Большаков В.И., Калинин А.В. Особенности структурообразования модифицированных Si-Mn–сталей // Строительство, материало-ведение, машиностроение. 2016.–Вып.89.–С.24-29.

8. Борисенко В.Е. Наноматериалы и нанотехнологии / В.Е. Борисенко, Н.К.Толочко – Минск: изд. центр БРУ, 2008. – 375 с.

9. Головин Ю.И. Введение в нанотехнологию / Ю.И. Головин. М.: Машиностроение, 2003. – 112с.

10. Большаков В.И. Структурная теория упрочнения конструкционных сталей и других материалов / В.И. Большаков, Л.И.Тушинский – Днепропетровск: изд. Свидлер, 2010 – 471 с.

11. Vanovsek W., Bernhard C., Fiedler M., Posch G. Influence of aluminum content on the characterization of microstructure and inclusions in high-strength steel welds – Weld World – 2012 – 07 December – 11P.

12. О применении нанопорошков тугоплавких соединений при лазерной сварке и обработке металлов и сплавов / Черепанов А.Н., Афонин Ю.В., Маликов А.Г., Оришич А.М. // Тяжелое машиностроение .- 2008 .- №4/2 .- С.25-26

13. Физико-химические расчеты электросталеплавильных процессов .- Григорян В.А., Стомахин А.Я., Пономаренко А.Г. и др. .- М.: Металлургия .- 1989 .- 288с.

14. Svensson, Lars Erik. Control of microstructures and properties in steel arc welds / Lars-Erik Svensson. CRC Press, Inc., 2000 Corporate Blvd., N.W., Boca Raton, Florida .- 1994 .- 261c.

15. Solidification control of submerged arc welds in steels by snoculation with Ti . Heintze, R. Mc Pherson .- Welding journal .- #3 .- 1986 .- p. 71-82.

16. Modeling the evolution of microstructure in steel weld metal / H.K.D.H. Bhadeshia, L.E. Svensson // Mathematical Modeling of Weld Phenomena, eds H. Cerjak, K.E. Easterling .– Institute of Materials, London .– 1993 .– pp.109–182.

MEDICAL SCIENCES

COMPLICATIONS OF UNTIMELY SURGICAL TREATMENT OF SPINAL CANAL STENOSIS AT THE LEVEL OF THE CERVICAL SPINE (ANALYSIS OF A CLINICAL CASE)

Kuznetsova V.
Candidate of Medical Sciences, Associate Professor of the Department of Pharmacology and Clinical Pharmacology with a course in pharmaceutical technology, Federal State Budgetary Educational Institution of Higher Education "National Research Mordovian State University named after N.P. Ogareva ", Medical Institute, city of Saransk
Repina E.
Candidate of Medical Sciences, Associate Professor of the Department of Pharmacology and Clinical Pharmacology with a course in pharmaceutical technology, Federal State Budgetary Educational Institution of Higher Education "National Research Mordovian State University named after N.P. Ogareva ", Medical Institute, city of Saransk
Kuznetsova T.
Candidate of Medical Sciences, Doctor of Medical and Social Expertise, Federal Governmental Institution "Main Bureau of Medical and Social Expertise in the Republic of Mordovia" of the Ministry of Labor of Russia, city of Saransk
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ОСЛОЖНЕНИЯ НЕСВОЕВРЕМЕННОГО ОПЕРАТИВНОГО ЛЕЧЕНИЯ СТЕНОЗА ПОЗВОНОЧНОГО КАНАЛА НА УРОВНЕ ШЕЙНОГО ОТДЕЛА (РАЗБОР КЛИНИЧЕСКОГО СЛУЧАЯ)

Кузнецова В.А.
кандидат медицинских наук, доцент кафедры фармакологии и клинической фармакологии с курсом фармацевтической технологии, федеральное государственное бюджетное образовательное учреждение высшего образования «Национальный исследовательский Мордовский государственный университет имени Н.П. Огарева», Медицинский институт, город Саранск
Репина Е.А.
кандидат медицинских наук, доцент кафедры фармакологии и клинической фармакологии с курсом фармацевтической технологии, федеральное государственное бюджетное образовательное учреждение высшего образования «Национальный исследовательский Мордовский государственный университет имени Н.П. Огарева», Медицинский институт, город Саранск
Кузнецова Т.Ю.
кандидат медицинских наук, врач по медико-социальной экспертизе, федеральное казенное учреждение «Главное бюро медико-социальной экспертизы по Республике Мордовия» Минтруда России, город Саранск

Abstract
The aim of the work was to show the relevance of timely surgical treatment in the presence of spinal canal stenosis by the example of a clinical case analysis.
Аннотация
Целью работы было показать актуальность своевременного оперативного лечения при наличии стеноза позвоночного канала на примере разбора клинического случая.

Keywords: disc herniation, spinal canal stenosis, paresis.
Ключевые слова: грыжа диска, стеноз позвоночного канала, парез.

Дегенеративно-дистрофические заболевания позвоночника (ДДЗП) относятся к числу наиболее частых причин временной и стойкой потери трудоспособности населения в развитых странах мира.

В исследовании Российского НИИТО им. Р.Р. Вредена указано число обращений за медицинской помощью по поводу ДДЗП - 51,2 на 1000 населения.

Одной из наиболее инвалидизирующих деформаций позвоночного канала является его стеноз, который подразумевает под собой сужение границ позвоночного канала с компрессией его содержимого и развитием неврологического дефекта [1].

Среди заболеваний позвоночника одним из наиболее частых является поражение шейного от-

дела позвоночника, что проявляется многообразием клинических проявлений. Так стеноз позвоночного канала на шейном уровне сопровождается развитием синдрома шейной миелопатии. По эпидемиологическим данным, частота встречаемости стеноза шейного отдела составляет 1 случай на 100 000 населения [2,3].

На прием обратилась пациентка Г. 1994 г.р.

На момент осмотра предъявляла жалобы на слабость и онемение в конечностях, больше слева, боли в шее, затруднения при передвижении и самообслуживании.

Анамнез заболевания: Заболела остро 23.10.2020г., когда внезапно появились боль в затылке и шее, после чего присоединились слабость и онемение в конечностях. Вызванной бригадой скорой помощи доставлена в Республиканский сосудистый центр. Госпитализирована в реанимационное отделение. После выписки лечение продолжала амбулаторно – с минимальным положительным эффектом.

Анамнез жизни: Материально-бытовые условия удовлетворительные. Перенесенные заболевания: с 2010г. наблюдалась у невролога по поводу стеохондроза шейного отдела позвоночника, в марте 2020г. после проведения МРТ шейного отдела позвоночника осматривалась нейрохирургом, было рекомендовано оперативное лечение, от которого пациентка отказалась.

Объективно: температура 36,5^{0}С. Состояние удовлетворительное. Сознание ясное. Телосложение: нормостеническое. Кожные покровы и видимые слизистые бледно-розовые, чистые. В зеве спокойно. Периферических отеков нет. Высыпаний нет. Над легкими дыхание везикулярное ослабленное, хрипов нет. ЧД 17 в мин. Тоны сердца ясные, ритм правильный. ЧСС 70 уд в мин. АД 120/80 мм.рт.ст. Ротовая полость в норме. Язык влажный, чистый. Живот мягкий безболезненный при пальпации. Печень не увеличена, безболезненна при пальпации. Симптом поколачивания отрицательный с обеих сторон. Стул и диурез со слов не нарушены.

Неврологический статус: Астенизирована. Глазные щели, зрачки D=S. Нистагма нет. Конвергенция сохранена. Лицевая мускулатура симметрична. Язык по средней линии. Сухожильные рефлексы D<S, живые. Снижение болевой и температурной видов чувствительности справа, глубокой чувствительности слева. Легкий левосторонний гемипарез (периферический парез левой верхней конечности, центральный парез левой нижней конечности). В позе Ромберга отклоняется влево. Координаторные пробы выполняет с интенцией справа, с гиперметрией слева. Пальпация паравертебральных позвоночника безболезненна, движения в шейном отделе позвоночника резко ограничены, болезненны. Походка гемипаретическая.

Предоставлена медицинская документация:

1). Выписка из карты стационарного больного неврологического отделения для больных с острым нарушением мозгового кровообращения РСЦ ГБУЗ РКБ №4, где прошла курс стационарного лечения с 23.10.2020г. по 06.11.2020г. с диагнозом: Основное заболевание: Ишемический (атеротромботический) инсульт в вертебробазилярном бассейне от 23.10.2020г., умеренный тетрапарез. Сопутствующие заболевания: Остеохондроз шейного отдела позвоночника, осложненный грыжеобразованием С5/С6, С6/С7, синдром вертебробазилярной недостаточности, стадия нестойкой ремиссии. Гипертоническая болезнь III ст., риск IV. Миопия слабой степени.

Неврологический статус при поступлении: Сознание ясное. Оценка по шкале NlHSS 16 баллов. Оценка по шкале Рэнкин 4 баллов. Индекс мобильности Ривермид 1 балл. Оценка по шкале комы Глазго 15 баллов. Оценка по шкале Бартела 10 баллов. Глазные щели D=S, зрачки D=S. Фотореакция сохранена. Нистагма не выявлено. Движения глазных яблок в полном объеме. Лицевая мускулатура: симметричная. Язык по средней линии. Глоточные рефлексы сохранены. Чувствительные нарушения: гипестезия с обеих сторон. Сухожильные рефлексы: D<S, оживлены. Мышечная сила: грубый тетрапарез, больше слева. Тонус мышц на стороне пареза (по шкале Ашфорт) S=D. Координаторные пробы не выполняет с обеих сторон. Патологические рефлексы: симптом Бабинского положительный с обеих сторон. Менингеальные знаки отрицательные.

Неврологический статус при выписке: Сознание ясное. Оценка по шкале N1HSS 10 баллов. Оценка по шкале Рэнкин 4 балла. Индекс мобильности Ривермид 7 баллов. Оценка по шкале комы Глазго 15 баллов. Оценка по шкале Бартела 70 баллов. Глазные щели D=S, зрачки D=S. Фотореакция сохранена. Нистагма не выявлено. Движения глазных яблок в полном объеме. Лицевая мускулатура: симметричная. Язык по средней линии. Речь не нарушена. Глоточные рефлексы сохранены. Чувствительные нарушения: правосторонняя гемигипестезия. Сухожильные рефлексы. D<S. Мышечная сила: тетрапарез (в правых конечностях - 4,5 балла, в левых: в руке - 4 балла, в ноге 4 балла). Координаторные пробы выполняет неуверенно с обеих сторон, более выражено слева. Патологические рефлексы: не выявлены. Менингеальные знаки отрицательные.

23.10.2020 - Эхокардиография: Камеры сердца не увеличены. Клапанный аппарат интактный. Диастолическая функция ЛЖ не нарушена. МР 0-1 ст. Нарушения локальной и глобальной сократимости левого желудочка не выявлено.

23.10.2020 - Дуплексное сканирование экстракраниальных отделов брахиоцефальных артерий: Макроангиопатия (С-образный изгиб правой внутренней сонной артерии). Малый диаметр правой позвоночной артерии (ПА). Компрессия обеих ПА на уровне С3-4 справа и С4 слева. Непрямолиней-

ность хода ПА каналах поперечных отростков шейных позвонков, что, очевидно, обусловлено остеохондрозом шейного отдела позвонков.

23.10.2020г., 25.10.2020г. КТ головного мозга: Патологических изменений в веществе головного мозга не выявлено.

05.11.2020г. МРТ головного мозга: МР - картина умеренного расширения конвекситального ликворного пространства.

При выписке гипотензивные, гиполипидемические препараты не рекомендованы. Рекомендовано: МРТ головного мозга с контрастированием. МРТ шейного отдела позвоночника.

2) По данным амбулаторной карты (ведется с 2017г.): после выписки из круглосуточного стационара обращений по поводу ухудшения состояния не было, в круглосуточные стационары не обращалась, не лечилась, гипотензивные препараты не принимает.

20.02.2021 – Осмотр терапевта: Гипертоническая болезнь III ст., риск IV. ХСН 0 ст. Гипотензивная терапия не назначена. Рекомендовано: амбулаторное наблюдение у невролога.

24.02.2021 – Осмотр хирурга: Хирургической патологии не выявлено.

25.03.2021 – Осмотр офтальмолога: Миопия слабой степени. Ангиопатия сетчатки.

Лабораторные исследования:

25.02.2021 Триглицериды - 1,1 ммоль/л

25.02.2021 Холестерин - 3,81 ммоль/л

Инструментальные исследования:

21.11.2020г. МРТ головного мозга с контрастным усилением: МР - картина умеренного расширения конвекситального ликворного пространства.

19.12.2020г. МРТ головного мозга: МР картина умеренного расширения конвекситального ликворного пространства.

21.11.2020г. МРТ шейного отдела позвоночника с контрастным усилением: МР картина умеренных дегенеративно-дистрофических изменений в шейном отделе позвоночника. Грыжи дисков С5/С6 и С6/С7 = 4,5 мм (с компрессией корешков). Абсолютный стеноз позвоночного канала на уровне диска С6/С7. Протрузии дисков С3/С4 и С4/С5. По сравнению с МР исследованием от 28.02.2020г. отмечается минимальное увеличение грыж дисков в размерах (размеры грыжи дисков С5/С6 = 3 мм и С6/С7 = 3,5 мм).

20.12.2020 МРТ шейного отдела позвоночника: МР картина умеренных дегенеративно дистрофических изменений в шейном отделе позвоночника. Грыжи дисков С5-С6, С6-С7 (с компрессией корешков) = 4,5 мм. Стеноз позвоночного канала на уровне С5-С7. Унковертебральный артроз. По сравнению с МР исследованием от 21.11.2020г. Рекомендовано: консультация нейрохирурга.

К нейрохирургу после проведения МРТ шейного отдела позвоночника 20.12.2020г. не обращалась.

Мнение по диагнозу: Дегенеративно-дистрофическое заболевание позвоночника. Ишемическая миелопатия на фоне абсолютного стеноза позвоночного канала на уровне диска С6-С7 с легким левосторонним гемипарезом.

На осмотр приглашен нейрохирург. Рекомендовано оперативное лечение.

Таким образом, рассмотренный клинический случай подтверждает актуальность проблемы дегенеративно-дистрофических заболеваний позвоночника в молодом возрасте, своевременность проведения оперативного лечения. Кроме того, показаны трудности в постановке клинического диагноза при остром возникновении паретических дефектов в неврологическом статусе пациентов.

References

1. Antipko LE. Spinal Canal Stenosis. Voronezh: IPF “Voronezh”, 2001. 272 p. [Published in Russian].

2. Bland JH. Disorders of the Cervical Spine: Diagnosis and Medical Management. 2nd ed. Philadelphia: W.B. Saunders Company, 1996. 120 p.

3. Byvaltsev V.A., Shepelev V.V., Nikiforov S.B., Kalinin A.A. Isolated and combined degenerative tandem stenoses of the spinal canal of the cervical and lumbar spine: literature review. Spine Surgery, 2016. Vol.13, No. 2, pp. 52-61. [Published in Russian].

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