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**PROBLEMS OF THE ORIGIN AND FUNCTIONING
OF THE UKRAINIAN SCIENTIFIC AND TECHNICAL DISCOURSE**

У статті порушено питання про сучасний стан українського науково-технічного мовлення. Визначено, що на його формування і функціонування впливала низка негативних чинників, з-поміж яких основними були різноманітні заборони на використання української мови (у книгодрукуванні, освіті, офіційному спілкуванні) у царській Росії та в радянський період. Зазначено, що за роки незалежності в Україні було досягнуто певного прогресу щодо формування та функціонування українського науково-технічного мовлення (проведено низку конференцій, присвячених дослідженню проблем української термінології і науково-технічного мовлення; збільшився обсяг науково-технічної літератури, друкованої українською мовою; українську мову почали більш активно використовувати в ланках освіти (як середній, так і вищій); зросла кількість різноманітних лексикографічних видань (двомовних технічних словників, довідників, енциклопедій і т. ін.): українську мову впроваджують в обслуговування виробничих процесів різноманітних галузей). Водночас аналіз загального стану розвитку та функціонування українського науково-технічного мовлення засвідчив, що на сучасному етапі його не можна вважати задовільним. У цьому зв'язку запропоновано низку заходів соціально-політичного і лінгвістичного характеру, що спрямовані на підвищення рівня українського науково-технічного мовлення (впровадження української мови в усі сфери науки і техніки України; збільшення обсягу україномовної науково-технічної літератури; вироблення теоретичних засад формування і функціонування української термінології і науково-технічного мовлення; укладання лексикографічних джерел науково-технічного характеру; переклад українською мовою популярних закордонних наукових і технічних видань; стандартизація української наукової і технічної термінології).

Ключові слова: науково-технічне мовлення, термінологія, стан, причини, заходи.

В статье проанализировано состояние украинской научно-технической речи. Определено, что на ее формирование влиял ряд негативных факторов, среди которых основными были различные запреты на использование украинского языка в царской России и в советский период. Отмечено, что хотя за годы независимости в Украине был достигнут определенный прогресс относительно формирования и функционирования украинской научно-технической речи, ее общее состояние не является удовлетворительным. В этой связи предложен ряд мер социально-политического и лингвистического характера, направленных на повышение уровня украинского научно-технической речи.

Ключевые слова: научно-техническая речь, терминология, состояние, причины, меры.

The paper is dedicated to the analysis of the actual state of the Ukrainian scientific and technical discourse. It was found out that its formation was influenced by a number of negative factors among which different types of banning of the Ukrainian language usage in tsarist Russia and in the Soviet period. Although much has been done to improve the state of academic discourse within the years of Ukrainian Independence, its general state is not considered to be satisfactory. In this regard, a number of measures of socio-political and linguistic character, aimed at improving Ukrainian scientific and technical language are proposed.

Key words: scientific-technical discourse, terminology, state, reasons, measures.

Functioning and development of the Ukrainian scientific and technical discourse (in other words – academic writing [2] or style of scientific prose [3]) is one of the important and critical problems of the Ukrainian language today. Very few books of technical or scientific character are published in Ukraine in comparison with a number of manuals for school as well as novels, stories and tales or works of fiction.

There are also too few discussions about this discourse at various scientific conferences as well as in mass media inside and outside the country. At the conference «Language and Culture» (Kyiv, 22-25 June 2015), for example, there were only three reports dedicated to different aspects of the Ukrainian scientific and technical discourse (including terminology) out of about 400 reports in total [4]. Out of 52 reports presented at the conference dedicated to the Japanese language and literature (Kyiv, 21-22 March 2014) only two dealt with Ukrainian and Japanese terminology [9]. Another scientific conference «Актуальні проблеми філології. Американські та Британські студії» (Kyiv, 25-27 April 2012) included 150 reports, only seven of them were aimed at analysis of terminology [5]. In the collection of works of the conference «General and Specialist Translation / Interpretation: Theory, Methods, Practice» (Kyiv, 17-18 April 2015) we have found 12 papers dedicated to translation of professional terminology out of all 77 items [12]. It shows some positive tendency. Analysis prove that only 10% of all magazines and 30% of newspapers were published in Ukrainian in 2014-2015. Although Ukrainian books made 55% of all published, most of them were manuals for schools and colleges, different training resources as well as works of fiction [6].

What are the reasons of such a situation after 24 years of Ukraine's Independence? Our paper sets out to review causes of this condition and point out some ways of improving it.

Nowadays science and engineering are so much developed everywhere in Ukraine that almost two thirds of the able-bodied Ukrainian population work in industry, economy, commerce and other sectors of social life, and that is why they have to regularly use scientific and technical version of the language while talking or writing. The base of this discourse is comprised of everyday common vocabulary and of words that refer to special concepts (these words and expressions are called terms), which are combined into sentences by some grammar and syntactic rules. Terminology is being studied now rather successfully, but the rules of sentence formation with term combinations are researched very rarely [7].

The influence of scientific and technical discourse (academic writing) and particularly of terminology upon literary and everyday language was established long ago. Hence, over the past seventy years the former Soviet authorities instigated a number of measures in order to limit the usage of the Ukrainian language, reduce and narrow the quantity of people practicing words of scientific and technical vocabulary or even completely remove its application by the Ukrainian people at large.

The purpose of the first series of measures was to eliminate sources of formation, development and functioning of the Ukrainian scientific and technical discourse and particularly terms and their acceptance by ordinary (everyday) language. To secure this objective, the former Soviet power deliberately performed the following steps:

1. Most administrative and management offices, industrial enterprises (plants and factories), higher educational establishments, research and design offices in Ukraine were forced to use only the Russian language. The Ukrainian language was excluded from use by almost all industrial administrations and offices; it was not practiced in scientific, technical, and business documents. Therefore, workers, scholars, engineers, businessmen and ordinary people did not have any Ukrainian dictionaries and had to use successfully or not successfully Russian professional vocabularies. There was no other choice.

2. Applicants for academic degrees had to write their theses in Russian, for there was only one all-union certifying commission in Moscow (VAK), and its official language was Russian. There were no similar commissions in other Soviet republics to evaluate theses in native languages and issue (grant) certificates.

3. Discovery documents and patent specifications were checked and then published by the all-union institute of experts in Moscow. The institute processed all papers and issued patents and certificates only in Russian.

4. Most scientific and technical meetings and symposia in Ukraine were held in Russian (with very few exceptions).

5. Majority of scientific and technical magazines were published in Russian.

6. About ninety percent of scientific and technical books were also published in Russian.

7. Almost all foreign scientific and technical research texts were translated into Russian.

8. Considerable number of technical and scientific subjects at higher educational institutions was taught in Russian.

9. Very few Ukrainian dictionaries of foreign languages in various fields of science and engineering were published during seventy years of Soviet control. The quantity of copies of the published dictionaries (in mathematics, geology, cybernetics etc.) was insignificant. No English-Ukrainian, German-Ukrainian, French-Ukrainian or Japanese-Ukrainian technical dictionaries were published. In this way, even previously existing Ukrainian terms were not systematized, fixed or popularized among employees of technical institutions and enterprises.

Thus, as a result of above mentioned measures, were eliminated or never established all sources of information in Ukrainian scientific and technical discourse. There was no necessary vocabulary to be admitted, adopted and used by common and literary language. Under these conditions of total russification, a Ukrainian engineer or scholar, in fact, could not be and remain a bearer of Ukrainian terms and consequently of the Ukrainian language.

In the course of more than twenty years of independence of Ukraine some of these obstacles were eliminated. Ukrainian is a language of instructions nowadays in most of schools and higher educational establishments. Hundreds of professional dictionaries (Ukrainian explanatory, professional, foreign language – Ukrainian) were published. Some very interesting technical books were translated into Ukrainian (e.g. «The Physics of Future» by Micio Kaiku (Lviv, 2013)).

But a number of obstacles produced by the former Soviet power remained. Moreover the Yanukovich government's minister of education D. Tabachnik abolished the decision of J. Timoshenko for applicants for scientific degrees to pass the state examination in the Ukrainian language. The above-mentioned raises the question: Who in this case will create the new Ukrainian terminology if engineers and scholars do not know their native language?

So even at present time the Ukrainian language slowly loses its own distinctive features and acquires some features (characteristics) of another one. This process can result in denial of the Ukrainian language's existence altogether by some Ukrainophobic politicians and linguists who ignore actual facts. It happened in the past, for example, when the tsar's minister of education P. Valuyev issued in 1863 the grievous instruction concerning the Ukrainian language, and in 1876 the Emsk ukase of the tsar Alexander III was adopted. Both laws outlawed the publication of any word in the Ukrainian language and access of any Ukrainian books from abroad because it was only a «malorussian dialect of the Russian language».

During the Soviet era the intensity of lexical and grammar borrowings from Russian increased in such a way that in the course of only two years (1934-1935) the Institute of Linguistics of the Academy of Science of the USSR had eliminated from the Ukrainian language about 14500 Ukrainian technical words and replaced them with some borrowed (perverted) terms [10].

What can be done to transform Ukrainian academic discourse into a viable, understandable, and wide-spread part of the Ukrainian language distinguished by very rich vocabulary and grammar resources?

The principal objectives of ongoing social and linguistic work in Ukraine were elaborated at many international scientific symposia in Lviv in the 1990s and 2010s, as well as at many international congresses of Ukrainian studies in Kyiv, Kharkiv, Odessa and other town's universities. These aims are the following:

1. To restore all sources of origin, development and functioning of the Ukrainian scientific and technical discourse including terminology and syntactic structures in common language.
2. To establish a special Committee for coordination all activities for widening, increasing and expansion the area of application and using scientific and technical variety of the language.
3. To publish in Ukrainian more popular scientific journals similar to English «Popular Science», «Scientific American», «Popular Mechanics» or French «Science et Vie» etc.
4. To publish Ukrainian – Foreign language technical dictionaries and reference books in all fundamental fields of science and engineering.
5. To translate into Ukrainian and publish more science fiction novels of foreign writers such as Herbert Wells, Jules Verne, Ray Bradbury, Isaac Asimov, Arthur Clarke and others.
6. To publish in Ukrainian more technical and reference foreign books in all fundamental fields of science and engineering.
7. To arrange regular translation of foreign scientific and technical information into Ukrainian.

Everybody understands that only stable technical, economic and scientific progress of the country is a reliable guarantee of its prosperous development. But successful growth is impossible if the native language is not ready to be an effective and sure means of expression scientific and technical ideas. Special technical discourse is a logical necessity of realizing this purpose.

In our opinion, Ukrainian authorities should in this case follow the French government activities in the period of 1945-2000 in approving 10 laws, 26 decrees and 40 legislative orders to defend the French language functioning. Most of these legislative documents concerned French scientific terminology. Charles De Gaulle, the famous French president, in 60s of the previous century banned the publication of any NATO documents in France in English. Michel Rockar, the prime minister of France, signed in 1991 a decree to set up a special Committee for evaluation any scientific terminology and particularly neologisms [13]. The law N.94-665 (August 4, 1994) obliged to use only French at any scientific conference, meeting and while signing contracts between industrial companies, plants and factories as well as at the time of radio and TV transmissions. According to this law a special agency was to be established to check and prosecute the law violators [1].

The experience of French society in protecting its state language is a very useful example for Ukrainians how to respect and take care of the most important and most valuable national heritage and how to create some favorable conditions and strong base for its existing.

Let us consider a set of causes resulting in a deterioration of the state of the Ukrainian scientific and technical discourse nowadays, that is of terminology, syntactic and stylistic features. Although its development and functioning has been somewhat improved in the course of past twenty years, in comparison with other styles Ukrainian academic writing remains retarded. There are many people even in our days that use *производство* instead of *виробництво*, *станок* instead of *верстат*, *отвертка* instead of *викрутка*, *командировка* instead of *відрядження*, *ток* instead of *струм*, *провод* instead of *дріт*, *выключатель* instead of *вимикач* etc. A lot of Ukrainian terms were simply replaced by Russian ones. Some of russified terms were legalized and included into Russian-Ukrainian technical dictionaries. To achieve this objective the following actions were performed:

1. Generally fixed Ukrainian common technical words were replaced by corresponding Russian terms without any phonetic and morphological change. For example, *потужність* was replaced by *мощность*, *пристрій* by *устройство*, *опір* by *сопротивление*, *вантажник* by *грузчик*, *постачання* by *снабжение*, *тиск* by *давление*, *напор*, *прилад* by *прибор*, *будова* by *стройка*, *кермо* by *руль*, *важіль* by *рычаг*, *запобіжник* by *предохранитель*, *цвях* by *гвоздь* etc.

2. A considerable number of Russian technical words were used in Ukrainian with some morphological changes in place of already existing Ukrainian terms. These changes, however, were not peculiar to the Ukrainian language. So, *залізна дорога* was used in place of well-known Ukrainian word *залізниця*, *роцот* instead of *розрахунок*, *щотчик* in place of *лічильник*, *літейка* instead of *ливарня*, *автопогрузчик* in place of *автовантажувач*, *ведучий інженер* instead of *провідний інженер*, *сортировщик* in place of *сортувальник*, *хозроцот* in place of *госпрозрахунок* etc.

3. Some Ukrainian common technical verbs were replaced by Russian ones. For instance, *вмикати* was replaced by *включать*, *навантажувати* by *загружать*, *будувати* by *строить*, *гальмувати* by *тормозити*, *вийти з ладу* by *спортитись*, *складати* by *собирать*, *коштувати* by *стоить*, *перемикати* by *переключать*, *фарбувати* by *красить*, *зупинити* by *останавить*, *натискати* by *нажимать* etc.

4. Certain artificial expressions formed in accordance with rules of the Russian language were used instead of Ukrainian common scientific and technical expressions with fixed prepositions, e.g. the expression *справа в тому* was used in place of *річ у тому*, *по правилам користування* instead of *за правилами користування*, *по якому питанню* in place of *у якій справі*, *працювати зверх плану* instead of *працювати понад план*, *по технічним причинам* in place of *через технічні причини*, *за вимогою замовника* instead of *на вимогу замовника*, *по підрахункам* in place of *за підрахунками*, *по вині контролера* instead of *з вини контролера*, *при допомозі* in place of *за допомогою*.

5. Russian modes of expression imposed word-combinations unnatural to Ukrainian language, e.g. *при розв'язанні задач* instead of *розв'язуючи завдання*, *по закінченню совещання* in place of *закінчивши нараду*, *при необхідности* instead of *коли треба*, *в належному порядку* in place of *як належить*, *як слід*, *при обговоренні* instead of *обговоруючи*, *під час обговорення* [11, p. 47–50].

6. A number of new scientific and technical words were borrowed from foreign languages through Russian, although direct borrowing could have produced more natural results, e.g. *насос* instead of *помпа* (Eng. pump), *жесть* in place of *бляха* (Germ. Blech), *провід* instead of *дріт* (Germ. Draht), *масло* in place of *оля* (Eng. oil), *бутылка* instead of *фляжка* (Germ. Flasche), *карта* in place of *мапа* (Germ. Mappe), *духи* in place of *парфуми* (French parfumes).

Generally speaking, all of the above-mentioned linguistic changes are actually borrowings, which are natural and typical for every language, only if their quantity is not too high. The number of technical words borrowed from Russian, however, greatly outnumbers borrowings from other foreign languages. Moreover, these borrowings often replace morphological, syntactic and stylistic patterns and constructions of the Ukrainian language. Therefore, their influence upon the internal structure of language is negative. The language loses its own distinctive features and acquires characteristics of another language.

What is necessary to do to transform Ukrainian scientific and technical discourse (terminology and syntactic structures) into a viable, wide-spread, understandable, and reliable version of the Ukrainian language and turn the development of this discourse around 180 degrees?

The principal goals of terminological and syntactic work in Ukraine were elaborated at many international scientific symposia and conferences in Ukraine in the period of 1999-2015. These objectives at the linguistic level are the following:

1. To eliminate from the Ukrainian scientific and technical vocabulary those technical words which are not natural for the Ukrainian language.
2. To coordinate national terminology with international standards.
3. To perform linguistic research of the Ukrainian scientific and technical discourse in comparison with the terminology and syntactic structures of English, German, French, Japanese and other foreign languages.
4. To carry out regular standardization of scientific and technical words.
5. To constantly enrich the Ukrainian technical vocabulary with borrowings from foreign languages and with lexical and grammar units inherent to Ukrainian.
6. To comprehensively introduce into Ukrainian scientific and technical discourse words and expressions of new branches of technology and science.

One more point to be stressed is that scientific and technical terminology, although being a substantial part of common language, constitutes only 5 to 17 percent of all lexical units in different registers of scientific language [8]. The rest of vocabulary are common lexical units which can be easily learned and mastered by most citizens of Ukraine despite their nationality, providing they are free of disdainful attitude toward Ukrainian being a less worthy dialect of Russian.

Penetration of new scientific and technical words from foreign languages into Ukrainian cannot be stopped and we should do everything possible to submit all borrowings to the laws of the Ukrainian language, to its inherent phonetic, morphological, syntactic, and stylistic features which make this language so strongly melodic, so peculiar and so beautiful that Ukrainians are capable to observe and perceive objects of the surrounding world in their own way and, consequently, remain Ukrainians in all difficult social and political aspects of their lives.

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