LATIN AS AN INTERNATIONAL LANGUAGE OF SCIENCE

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Abstract
Scientific terminology is a system of names of things and phenomena, which enables scientists to make themselves understood. A term which denominates a thing or a phenomenon must be unambiguous, precise and definite. Latin is an ideal language for science for its stability and precision.
The influence of Latin, as an international language of science on medical terminology; the history and the outline of the development of medical terminology and the unification of medical terminology of different countries were reviewed in this article.

Scientific terminology – it is a system of names of things and phenomena, which enables scientists to make themselves understood. A term[1] which denominates a thing or a phenomenon must be unambiguous, precise and definite. Latin and Ancient Greek languages are referred to as "dead" languages. They are ideal for science. Their word meanings fixed in time and disuse, though have sufficient word – formation resources. For its stability and precision Latin was an international language of medicine for centuries. Latin provides a coherent matrix for learning and a context for all knowledge. The aim of this article is to review the influence of Latin as an international language of science on medical terminology.

According to Kazimieras Eigminas there isn't any other language in Europe which carried authority to European culture, science, literature, language studies, history and the whole societal life as Latin. Not only works of fiction, but works of mathematics, physics, astronomy, ballistics, cartography were written in Latin (Ulčinaitė 1993: 33). In the XIX century it was estimated that stems of languages of Balts (Lithuanian, Latvian, Prussian) and Italics (Latin, Umbrian, Oscan) originate from one language, called Indo-European parent language (Lelys 2002: 8). Nobody is astonished at cognation of Lithuanian and Latin languages.

Latin has influenced English, which belong to Indo-European parent language. English, unlike French, has many borrowings from other languages. Approximately a half of present English words are native of Latin. There are many English words, which did not change neither semantically nor orthographically, for example: *superior*, *census*, *inferior, actor, animal, error, exterior, fungus, genus, honor, minus, minimum*. Nearly 80% of all words in Romanic *id est* French, Italian, Spanish, Romanian and Portuguese languages are native of Latin. The professor of classical languages of the university of Georgia Richard A. LaFleur states that various studies have proved a significant coherency between Latin and other languages.

In the first books on grammar, which were written in Latin, as Danielius Kleinas "Grammatica Litvanica" (1653), Kristupas Sapūnas and Teofilis Gotlibas Šulcas "Compendium Grammaticae Litvanicae" (1673) etc., some attempts were made to standardize Lithuanian language (Eigminas 1976: 6). According to K. Gaivenis only Latin can be used as an international standard in some spheres of science (Gaivenis 1994: 11-17).

After Rome had lost its imperial dignity, Latin was considered to be a "dead" language Latin is not used in everyday life and accordingly it does not change. Medical terminology is the study of words that relate to body systems, anatomical structures, medical processes and procedures, and a variety of diseases that afflict human organisms (Gylys 1983: 1). Scientific studies of A. Vesalius (Andreas Vesalius; 1514-1564), scholars V. Harvėjus (William Harvey, 1578-1657), L. Rolando (Luigi Rolando, 1773-1831) were of great value to the process of developing medical terminology. V. Harvey's book „Exercitatio anatomica de motu cordis et sanguinis in animalibus" („Anatomical researches related to the movement of animal heart and blood") was very significant for medicine. The ideas of Belgian anatomist, a reformer of nomenclature, A. Vesalius have influenced the process of formation of terminology of many countries. In the work "Epitome" (1543) the concept of principles of tribal classification was presented for the first time. This anatomist used complicated sophistic Latin idioms. The major part of his anatomic terms did not survive. The teacher of A. Vesalius a Belgian anatomist J. Sylvius (Jacques Dubois; 1478-1555) and German anatomist A. Guenter (Guenter von

[1] *A term* - a word or a collocation, which names a special concept of a certain field of science, art or any other sphere of life (Kvašytė 2005: 65).

Andernach, Johann-Giunterius Andernaeus; 1487-1574) searched for the way out of this chaotic situation, which was formed by the enormous amount of synonymous terms. The terminology of these anatomists became the basis of the forthcoming anatomical terminology. Since 16th century the anatomical terminology was supplemented by new terms, which had a whole lot of synonyms. About 40000 terms were formed, each of which had 10 or more different names. The communication between anatomists became impossible.

German anatomist S. T. von Sömmering (Samuel Thomas von Sömmering, 1755-1830) avoided eponyms in German anatomical terminology. In the opinion of German scholar J. Henle (Jakob Gustav Friedich Henle; 1809-1885), only "one name for one structure" is possible. Hungarian anatomist of the 19th century J. Hyrtl (Joseph Hyrtl; 1811-1894) has analyzed 421 term in his book „Onomatogia anatomica". In the 17th-19th centuries about 40000 synonymic terms were expunged from the list of anatomical nomenclature. In 1900 about 10000 Latin anatomical terms were formed, which had no synonyms.

The first attempt to unify the anatomical nomenclature was made by the assembly of German anatomists. In Baseler congress in 1895 the project of nomenclature was discussed and approved. Later it was named Baseler nomenclature (Baseler Nomina Anatomica – BNA). European countries were German dominated, accepted BNA officially, but in many it went about passively. In 1933 the association of anatomists in Great Britain revised and annexed BNA (Birminghams revision – BR). In 1935 Jenaer association of anatomists admitted a new anatomic nomenclature (Jenaer Nomina Anatomica – JNA). It was presented in Milanese international congress of anatomists in 1936. However this anatomical nomenclature was sustained only in 1955 in VI congress of anatomists in Paris (PNA). Famous Lithuanian anatomists (S. Pavilionis, R. Stropus, K. Tamašauskas, A. Urbonas) used the terminology of this congress.

Afterwards in 1960 anatomical nomenclature was corrected in the VII congress in New York, in 1965 in the VIII congress in Wiesbaden, in 1975 in the X congress in Tokyo. Present anatomical nomenclature is called Nomina Anatomica. Ordered anatomical terms are presented in the original Lithuanian textbook "Žmogaus anatomija" (S. Pavilonis, R. Stropus, K. Tamašauskas, A. Urbonas, I ed., 1972). While ordering terms anatomical nomenclature of Paris was used (PNA 1955) with the corrections of New York (1960) and Wiesbaden (1965). In the second edition (1984) - (S. Pavilonis, E. Burneckis, V. Gavelis, R. Mikėnienė, R. Stropus, K. Tamašauskas, A. Urbonas, S. Žvirdauskas) the corrections of Tokyo (1975) were considered (Pavilonis 1993: 104).

In 1998 a new *Corpus, Terminologia Anatomica* was notified. FCAT (Federative Committee on Anatomical Terminology) approved *Latin expressis verbis* as "the best (ultimate) language of terminology". The chairman of FCAT I. Whitmore states, that Latin is universal and worldwide *id est* for the whole world and for all professional levels. It is a "dead" language, it does not belong to any nation.

The terminology of anatomy, botany, zoology and medicine in general is Latin and is formed according to certain international codices, which are usually approved in various international congresses. These codices are followed while standardizing nomenclatures of these spheres of science.

According to regulations of PNA, each organ must be called only by one term. For example: *akis – oculus* Vest.50, MTŽ385, ŽA549/comp. anglų *eye* ODN161/plg. pranc. *œil* TMP348/comp. latv. *acs* TM173; *blužnis – lien* MTŽ303, ŽA314/comp. anglų *spleen* ODN260/comp. pranc. *rate* TMP 279/comp. latv. *liesa* TM 998; *kepenys – hepar* MTŽ244, ŽA351/comp. anglų *liver* ODN206/comp. pranc. *foie* TMP 211/comp. latv. *aknas* TM797; *pėda – pes* MTŽ430, ŽA159/comp. anglų *foot* ODN350/comp. pranc. *pied* TMP 394/comp. latv. *pēda* TM 287.

The names of structural parts and organs of a human body must be Latin. Each country has the right to form equivalents of Latin terms in its mother-tongue. For example: *galva – caput* MTŽ89/comp. angl. *head* TMP67/comp. pranc. *tête/*comp. latv. *galva* TM288; *kelis – genu* MTŽ223/comp. anglų *knee* ODN186/comp. pranc. *genou* TMP188/comp.latv. *celis* TM 723; *pirštas – digitus* MTŽ149/comp. anglų *figer, toe* TMP127/comp. pranc. *doigt, orteil* TMP127/comp. latv. *pirksts* TM523; *tulžis – fel* MTŽ201/comp. angl. *gall, bile* TMP170/comp. pranc. *bile* TMP170/comp. latv. *žults* TM657.

Anatomical terms as terms in general must be short and informative. According to D. Lote any scientific-technical term must be precise, short and easy to form other terms. But sometimes very long anatomical terms occur.

Organs of a human body, which are topographically related are to be named by similar denotations: *veidinis nervas – nervus facialis* MTŽ371, ŽA524/comp. angl. *facial nerve* CMD238/comp. pranc. *nerf facial* TMP334/comp. latv. *sejas nervs* TM788**;** *veidinis gumburėlis*

– *colliculus facialis* MTŽ 113/comp. angl. *colliculus facialis* AHA508/comp. pranc. *petite élévation facial* TMP84,165/comp. latv. *sejas nerva u.*TM390.

In composite terms antonymic specific components are to be used: *didžiosios lytinės lūpos – labia majora pudendi* Vest.36/comp. angl. *labium majus pudendi* AHA23/comp. pranc. *grande lèvre de la vulve* TMP268/comp. latv. *kaunuma lielā lūpa* TM961; *mažosios lytinės lūpos – labia minora pudendi* Vest.136/comp. angl. *labium minus pudendi* AHA23/comp. pranc. *nymphe, petite lèvre de la vulve* TMP268/comp. latv. *kaunuma mazā lūpa* TM961. Eponyms are not to be used in official descriptive and microscopic anatomical nomenclature.

Scholars are of the opinion that Lithuanian terminology is of national and international origin (Klimavičius 1975: 92). In regard to the origin terms are different: they can be formed on the ground of own lexis, borrowings (as it was mentioned – generally Latin and the old Greek are used) and composite terms or hybrids: *gimda – uterus* Vest.121, MTŽ571, ŽA412/comp. angl. *uterus* AHA23, *uterus (womb)* CMD691/comp. pranc. *utérus, matrice* TMP/comp. latv. *dzemde* TM675; *nagas – unguis* Vest.34, MTŽ565, ŽA582/comp. angl. *fingernail* AHA33, CMD686/comp. pranc. *ongle, griffe* TMP565/comp. latv. *nags* TM662; *skrandis – ventriculus* Vest.104, MTŽ586, ŽA337/comp. angl. *gaster/ventriculus* AHA20, *ventricle* CMD700/comp. pranc. *estomac, ventricule* TMP580/comp. latv. *neliels iedobums vai kabata* TM693; *tiltas-pons* Vest.47, MTŽ451, ŽA463/comp. angl. *pons* AHA28, CMD524/comp. pranc. *pont* TMP413/comp. latv. *tilts, audi, kas savieno divas orgāna daļas* TM343; gimdos kaklelis – *cervix uteri* Vest.137, MTŽ99, ŽA412/comp. angl. *cervix* of *uterus* PAPh938/comp. pranc. col de l'*utérus* TMP76/comp. latv. dzemdes kakls TM332; nosies pertvara – *septum nasi* Vest.79, MTŽ498/comp. angl. *nasal septum* PAPh179/comp. pranc. *cloison nasale* TMP482/comp. latv. *deguna starpsiena* TM494; *stuburo smegenys – medulla spinalis* Vest.26, *nugaros smegenys* MTŽ329, ŽA443/comp. angl. *medulla spinalis* AHA27, 28/comp. pranc. *moelle épiniere* TMP299; borrowings (as it was mentioned – more often Latin and the Old Geek are used): *dentinas – dentinum* Vest.108, MTŽ140, ŽA322/comp. angl. *dentine* CMD174/comp. pranc. *dentine* TMP117/comp. latv. *dentīns* TM491; *odena – sclera* Vest.51, ŽA551/comp. angl. *sclera* AHA536, CMD591/comp. pranc. *sclérotique* TMP474/comp. latv. *sclēra, cīpslene, acsbaltums* TM480; *emalis – enamelum* MTŽ169, ŽA323/comp. angl. *enamelum* AHA135, *enamel* CMD/comp. pranc. *email* TMP514/comp. latv. *zobu emalja* TM587; and hybrids: danties *pulpa – pulpa* dentis MTŽ464/comp. angl. *pulpa dentis* AHA135, *pulp* PAPh774/comp. pranc. *pulpe, pulpe dentaire* TMP431/comp. latv. *pulpa*, *mīkstums* TM379; *danties kutikulė – cuticula dentis* MTŽ129/comp. angl. *cuticle* TMP109, *cuticle*, a layer of solid or semisolid material CMD161/comp. pranc. *cuticule* TMP109/comp. latv. *emaljas plēvīte, kas pārklāj jaunu, nendietotu zobu* TM447.

Lithuanian medical terminology is not old, but rather accordant. The development and perfection of medical terminology is a long and near work initiated at the beginning of the century by P. Avižonis, V. Lašas and further by – V. Astrauskas, S. Biziulevičius, S. Pavilonis, A. Vaitilavičius, A. Vileišis (Molytė 1997: 134). Anatomical terminology is being compiled gradually. The first folk names are found in the work of K. Sirvydas "Dictionarium trium linguarum", edited in 1620 (Pavilonis 1993: 100). Jonas Basanavičius collected and published near 270 Russian and Lithuanian medical terms, chose their Latin equivalents. He was the father of Lithuanian medical terminology. Some terms are used in anatomical terminology: *pilvinė plėvė, širdies plėvė, terpvietė*. In the publication „Medžiaga mūsų tautiškai vaistininkystei"(1989) (The material for our national pharmacy) 22 Lithuanian names of parts of a human body, organs, diseases, symptoms were presented. Some of the terms had Latin equivalents. The most significant work in regulation of Lithuanian anatomical terminology was exercised by Jurgis Žilinskas. We can find the terms which are used now in his textbooks „Osteologija and syndesmologija" (1932), „Splanchnologija" (1934). In his first textbook "Lectures of Neurology" (1923) only the beginning of term regulation was made, only Latin terms were presented. Latin terms are well-formed, according to Baseler nomenclature (Pavilonis 1993: 100). Vl. Lašas and J. Mackevičaitė-Lašienė did not accepte some of his terms. Pr. Skardžius stated, that it can be confirmed that "P. Avižonis regulated medical terminology of his field best of all other fields of medicine. He was the only physician who cared of medical terminology (Puzinas 1979: 89). G. Česnys, analyzing the history of Lithuanian anatomical terminology, emphasizes the merits of the most famous oculist P. Avižonis in regulating Lithuanian anatomical terminology. He communicated with Jonas Jablonskis and other linguists, prepared two grammar books, edited and translated them. P. Avižonis formed the perfect terminology of the eye. The famous oculist was a member of the Commission of Terminology since 1920. According to the author the perfect composition of anatomical terms can be considered as the standard to everybody who cares of Lithuanian terminology (Česnys 2002: 60). In the process of developing anatomical terms the translation of N. Tonkovas

textbook "Normaliosios žmogaus anatomijos vadovėlis" played a certain role. The translators (A. Jurgutis, S. Pavilonis, G. Stasiulionytė) corrected some terms of J. Žilinskas: *kaulo čiulpos* to *kaulų čiulpai, pirmosios falangos* to *pirmieji pirštakauliai, bevardis kaulas* to *dubenkaulį, gėdikaulis* to *gaktikaulį*, *stuburkaulis* to *slankstelį.* The original textbook "Osteologija" by A. Jurgutis was published in 1965, a textbook for medical schools „Žmogaus anatomija" (Human Anatomy) was published in 1967. Anatomical terminology in these textbooks corresponded to international anatomical nomenclature (PNA) (Pavilonis 1993: 102-103).

In studies of medicine, veterinary, natural history and some other fields of science Lithuanian and Latin terms often are presented together. Having very old traditions, Latin terminology in some cases is more precisious than Lithuanian, when the same thing in our dialects has several denotations (for example: *Caltha palustris – puriena, lukšta, aklinas, karvažolė, lapūgas, lukšis, purlė, žąsikojis, žąsnėrė ir kt.*) (Gaivenis 1965: 56). Often in some studies Latin terms are used with Lithuania, and in such cases particular composite terms are formed (Gaivenis 1965: 56). For example: *Pirminiai formuojasi dėl želatininės membranos, uždengiančios ductus nasolacrimalis atsivėrimo angą, dėl patologijos ašarų maišelyje arba ductus nasolacrimalis* (Daktaravičienė 1991: 131).

Sometimes the denotation of a concept does not hold in the radius of a word, as a term can be one-component and a fixed collocation (Gaivenis 2002: 14). Depending on the number of the components, medical terms, as terms in general, can be divided to one-component and composite terms. In anatomical nomenclature *Nomina Anatomica* axial names of a human body are one-component. All one-component Lithuanian and Latin anatomical terms are nouns. One-component anatomical terms make the minor part of all medical terms. They name the concepts of the axial parts of a human body and organs. For example: . Pvz.: *galva – caput* MTŽ89/comp. angl. *head* TMP 67/comp. pranc. *tête* TMP67/comp. latv. *muscuļa vai kaula galviņa vai sākums; kaklas – collum* ŽA 217/comp. angl. *neck* AHA 132/comp. pranc. *cou, col* TMP84/comp. latv. *kakliņš, kakls* TM391; *širdis – cor* ŽA257/comp. angl. *heart* AHA214/comp. pranc. *cœur* TMP100/comp. latv. *sirds* TM414; *kepenys – hepar* Vest.112/comp. angl. *liver* PAPh790, *hepar* AHA20/comp. pranc. *foie* TMP211/comp. latv. *aknas* TM797; *plaučiai – pulmones* Vest.82/comp. angl. *lungs* PAPh731/comp. pranc. *poumon* TMP431/comp. latv. *plauša* TM379. The major part of one-component anatomical terms are simple radical Lithuanian and Latin or Greek terms. It can be noticed that the majority of them are short terms, consisting of one or two syllables. The analyses of terms shows that one-component, consisting of three or four syllables are rare. For example: *slanksteliai – vertebrae* Vest.15/comp. angl. *vertebrae* PaPh183/comp. pranc. *vertèbre* TMP582/comp. latv. *skriemelis* TM697; *smegenėlės – cerebellum* Vest.47/comp. angl. *cerebellum* PAPh405/comp. pranc. *cervelet* TMP75/comp. latv. *smadzenītes* TM330; *perdanga – diaphragma* Vest.83/comp. angl. *diaphragm* PAPh296/comp. pranc.*diaphragme* TMP124/comp. latv. *diafragma, šķirtne* TM514; *kiaušidė – ovarium* Vest.137/comp. angl. *ovary* PAPh938/comp. pranc. *ovaire* TMP368/comp. latv. *olnica, sievietes dzimumdziederis* TM217; *virkštelė – umbilicus* Vest.143/comp. angl. *umbilicus (navel)* PAPh977/comp. pranc. *ombilic, nombril* TMP564/comp. latv. *naba* TM661; *kanalėlis – canaliculus* MTŽ87/comp. angl. *canaliculi* PAPh149/comp. pranc. *canalicule* TMP65/comp. latv. *kanāliņš* TM278.

The majority of medical terms make composite terms. According to A. M. Rassinoux, composite terms are the most productive (Ruch 2001: 1). S. W. Haas, R. M. Losee analyzed the usage and the frequency of terms in natural languages (Losee R. M., Haas S. W. 1995: 519-529). In V. Danilenko opinion only collocations may have precise scholarly expression, because the more words are in a term the more precise it is (Danilenko 1986: 12).

Resources:

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Abbreviations

AHA: FrickH. et al. Atlas of Human Anatomy. Switzerland: Karger, 1990. 599 p.

MTŽ: Astrauskas V. et al. Medicinos terminų žodynas. Vilnius: Mokslas, 1980. 993 p.

PAPh: Tortora J. G., Grabowski R. S. 1993: *Principles of anatomy and physiology*, New York: Addison-Wesley Educational Publishers, 1993. 1050 p.

ŽA: Pavilonis S. et al. Žmogaus anatomija. Vilnius: Mokslas, 1984. 616 p.

TPM: Arnaudov G. D. Terminologia medica poliglotta. Bulgaria: Medicina et physcultura, 1964. 1112 p.

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