THE ORIGINS OF MEDICAL TERMINOLOGY

Yuliya Vit
Ph.D., Associate Professor, I. I. Mechnikov Odessa National University, Ukraine
e-mail: juliavit24@gmail.com, orcid.org/0000-0002-3840-5666

Summary

The article is dedicated to the description of the origins of medical terminology. A brief historical note on the earliest written sources that have come down to us starting with Egyptian medical treatises written in hieroglyphs on papyrus is given. The contribution to the development of medical terminology of such great scientists and philosophers of antiquity as Alcmaeon of Croton, Homer, Aristotle, Hippocrates and the followers of his school, the Hippocratics, is considered. The Hippocratics were the first to describe diseases based on observation, and the names given by them to many conditions are still used today. The etymology of the terms introduced by these scientists is given in the article. With the Hellenistic era the names of Herophilus, Erisistratatus are associated. The emergence of the Alexandria Medical school predetermined the development of Medicine for many centuries to come. The article also highlights the processes of term formation that took place in Latin from the 2nd century BC, namely, the borrowing of Greek terms with their subsequent latinization. The mutual influence of Greek and Latin in the process of term formation is considered. The names of Lucretius Kara, Hippocrates, Celsus, Rufus of Ephesus are associated with the Roman period in the history of medical terminology. Throughout the subsequent development of medical science, medical terms of Greek-Latin etymology penetrated into the term systems of national languages, assimilating into them and turning into internationalisms.

Key words: medical terminology, origin, etymology, Greek terms, Latin terms, term-formation, international terms.

DOI https://doi.org/10.23856/5513

1. Introduction

Nowadays, in the context of accelerating scientific and technological progress, terminology, being a source of information and a tool for mastering specialties, is obtaining special meaning. There is practically no field of knowledge that could be studied without mastering its terminology.

Medical terminology is a specific layer of vocabulary and due to the peculiarities of structural, semantic, word-formation and stylistic character differs from commonly used words and, thus, occupies a special place in the lexical system of the language. Despite the large number of research works devoted to medical terminology in native and foreign literature (Chernyavskiy M.N., Novodranova D.F., Ivanov V.V., Kobzheva, Kiyak T.R., Shubov Ya.I., Tatarinova L.A., Chernova E.V., Rudinskaya L.V. and others), the linguistic aspect of the study of medical terminological vocabulary still needs in-depth research and continues to attract continues to attract the attention of linguists to the discovery of its new qualities, aspects, characteristics and features as a subsystem of the language.

This article is aimed at highlighting the sources and origin of medical terminology in general, and English ophthalmic terminology in particular. To this end such methods as the

method of etymological analysis, definitional analysis, word-formation analysis and descriptive method have been used.

2. The earliest written sources of medical terminology

Since ancient times, medical science has had its own terminology. It is known that scientific terminology plays an important role in any field of knowledge, as it "displays specific concepts in the system of names used in a particular science" *(Zakalyuzhnij, 1993: 3).* It is difficult to overestimate its importance for medical science, since it is the term systems that form the basis of the doctor's professional language. The professional medical terminology at the present stage is a product of the co-creation of different civilizations and cultures, multifactorial interlingual contacts, borrowings and transformations that have been in effect for millennia *(Chernyavskij, 1997: 25).*

One of the characteristic features of medical terminology in general, and English-language medical terminology in particular, is that it has been replenished and continues to be replenished due to the direct or indirect involvement of vocabulary and word-formation means of two classical languages of the ancient world - ancient Greek and Latin. This is evidenced, for example, by the fact that in modern English medical terminology 2/3 of the terms are of Greek and Latin origin *(Chikin,1990: 7).*

The history of semi-professional and professional healing embraces several millennia. “Their (doctors’) activity is the same age as man… It would be unfair to count the history of medicine from its written period” (I.P. Pavlov) *(Cited on Multanovkij, 1967: 31)*. The sources of the language of healing should be sought in the civilizations of the Ancient East. The earliest written sources that have come down to us are 10 Egyptian medical treatises written in hieroglyphs on papyrus. The most valuable of them are two papyri of the 2nd c. BC – The Ebers’ Papyrus and The Smith’s Papyrus. The Ebers’ Papyrus (named after the archaeologist G. Ebers, who found it) called "*The Book of Medicines for All Parts of the Body*" contains 300 prescriptions for treatment of the digestive system, respiratory tract, burns, bleeding, eye, skin and other diseases. The Smith’s Papyrus (named after the collector E. Smith) is a part of a vast treatise, the oldest extant surgical text in the history of medicine, on the structure of the human body and surgical treatment. The anatomical and clinical knowledge of the ancient Egyptians in the field of ophthalmology is also known from medical papyri. They describe a number of eye diseases, such as *lacrimation* ("water in the eye"), *pinguecula* ("fat in the eye"), *hemorrhages, leukoma, strabismus* and among others *"Rainy sky",* which probably meant *trachoma* .

On the territory of Sumer, Babylon and Assyria, archaeologists have found tens of thousands of cuneiform tablets, including medical content. Among them there are those that were used as a kind of educational terminological dictionaries. Thus, a collection of more than 30 tablets dates back to the second half of the 2nd millennium, in which, according to the thematic principle, the names of body parts, organs, as well as the designations of their functions, are selected. Other collections are combinations of tablets according to the symptoms of diseases or according to the names of the affected parts of the body, representing a kind of nomenclature of diseases *(Zabludovkij, 1981: 42).*

Healing and medical knowledge achieved certain success in Egypt, Sumer, and then in Assyria, and along with them, medical literature also developed. It is the Babylonian-Assyrian and Egyptian cultures that the ancient Greek medicine, which reached the greatest degree of independence in antiquity, is obliged to.

3. Greek origin

The earliest ancient Greek written sources that have come down to us are several fragments of medical texts by Alcmaeon of Croton dating back to the 6th century BC.

There are even more ancient literary (non-medical) texts, the role of which in the development of medical terminology is beyond doubt. These are the epic poems of Homer "Iliad" and "Odyssey". The Homeric epic contains a significant part of the names of almost all the most important parts of the human body and organs. Most of these names are used in one form or another in modern anatomy and clinical disciplines, for example, *blepharon, daktylos, derma, gaster, kardie (kardia), kystis, neuron, pleure, pneumon, rhachis, thorax* etc.

However, in fact, the history of European medicine and medical terminology begins with the "*Hippocratic collection*" *("Corpus Hippocraticum"),* which contains over 100 medical writings attributed to the greatest physician of antiquity, Hippocrates (460–377 BC). This collection includes works not only by Hippocrates and his disciples, but also by doctors representing other areas of medicine of that time. The most famous writings belonging directly to Hippocrates, are "*Aphorisms*", in which the essence of his teaching is briefly stated; theoretical essay *"Prognostikon" ("Prognosticon"),* representing the general properties of diseases; *"Epidemics" ("Epidemiai");* "*On the Nature of Man*" ("*Peri physeos tou anthropou"*) and "*The Oath*" ("*Horos"*; Latin "*Jus-jurandum*"), known in history as the "*Hippocratic Oath*".

The views of Hippocrates and the scientists of his school, hippocratics, about the eye and eye diseases are not presented systematically, but are scattered in various works. Hippocrates believed that outflows (rheumata) occur from the head into the eye, which is the cause of visual impairment. A significant place is given to *"ophthalmia",* which refers to various kinds of inflammation of the mucous membrane. Hippocratics distinguished between simple, granular and purulent inflammation, corresponding in modern ophthalmology to the concepts of *conjunctivitis, trachoma* and *blennorrhea*. Eye diseases were associated with climate and temperaments, in accordance with the teachings of Hippocrates.

In total, 20 eye diseases are mentioned in the works of hippocratics, among them: *blepharitis, glaucoma, cataract, amblyopia, amaurosis, strabismus, nystagmus.*

There is relatively little special medical vocabulary corresponding to the modern concept of the term in the "Hippocratic Collection".

The main linguistic value of the collection in this aspect is not so much the anatomical vocabulary, but that which relates to the field of physiology, pathology, symptoms and nosology (from the Greek. *nosos* – "disease", + *logos* – "teaching" – the doctrine of diseases and their classification). Modern English medical terminology has inherited many concepts from the writings of Hippocrates, such as *apophysis, bronchus, carcinoma, cholera, coma, emphysema, epidemic, kyphosis, nephritis, paresis, peritoneum, polyp (polypus), typhus, ureter* and others [1, 34]. The "Hippocratic Collection" was the basis for the subsequent development of medical terminology.

A significant contribution to the biomedical vocabulary was made by the Greek philosopher and scientist Aristotle (384–322 BC). From his writings, such names as *aorta, glaucoma, diaphragm, leucoma, trachea, pancreas, phalanx (phalange)* and others have entered the scientific language. Aristotle clarified the special meanings of a number of words already existing in the medical lexicon, for example, he narrowed the content of the word *mēninx, mēningos (sheath)* to the meaning of "*meninges*".

With the beginning of the Hellenistic era (late 4th – 1st century BC), the center of ancient Greek science and medicine moved to Alexandria, the capital of one of the Hellenistic

monarchies. It was there that the Alexandria Medical School, known all over the world, was established, having predetermined the development of medicine for many centuries to come. It was especially famous for the works by two outstanding doctors – Herophilus and Erazistratus, who left a noticeable mark in medicine, namely in anatomical terminology. If in the previous era the medical vocabulary was enriched mainly by borrowing the words of the spoken language, the Alexandrians introduced neologisms – artificial, specially created names. So, for example, Herophilus (approximately 300–250 BC) owns the authorship of such terms as the *prostate* (in modern English terminology – *prostate*), *diastole (diastole), systole (systole),* etc. the term *dodekadaktylon* (*duodenum*; from *dodeka* – which means "t*welve*" and *daktylos* – "*finger"*) goes back. Herophilus first drew attention to the existence of lymph nodes, mistaking them for glands and calling them *āden* (*glands*). This name (in Latin translation – *glandula*) lasted until the middle of the twentieth century, when it was replaced by the term *nodus lymphaticus* or *lymphonodus*, however, the root "gland" was preserved in English terminology and is used along with the term node (compare: *lymph gland, lymphatic gland, lymph node*). The misconception of Herophilus still makes itself felt: the term *aden-* is part of such terms as *adenopathy* (*adenopathy*) – a malignant tumor that develops from *lymphoid tissue; lymphadenitis (lymphadenitis*) – inflammation of the lymph node, etc.

Erazistratus (died in 250 BC) is the author of such neologisms as *parenchyma* (English *parenchyma*), *bulimia*, ("bull hunger"); *anastomosis (anastomosis*), preserved to this day, but somewhat changed their meaning. Modern medicine is indebted to Erazistrat for such terms as *neura aisthētika* and *neura kinetica* (sensory and motor nerves), *triglōchines hymens* (*tricuspid valve*; from *tri* – "three", + *glōchis, glōchinos* – "point, scar"), better known in Latin translation as *valvula tricuspidalis* (from *tri* – "three", + *cuspis, cuspidis* – "point, scar").

The Alexandrians did a lot to streamline and normalize the language of medicine. It was with their participation that it acquired the features of rigor and precision. Their authority was often appealed to by scientists and physicians of later eras.

Until the crisis of the ancient world, the Greek language actually performed the function of the international language of medicine, served as a means of professional mutual understanding for doctors of different ethnic groups *(Encyklopedicheskij slovar medicinskikh terminov, 1982: 411).* During this period, the Latin language did not have any influence on the development of biomedical vocabulary, even despite the establishment of Roman domination over Greece (146 BC) and the Hellenistic countries. Throughout its history, the Latin language was strongly influenced by Greek.

4. Latin origin

From the 2nd century BC. Rome begins to master the vocabulary of Greek science, philosophy and medicine, partially borrowing along with new concepts and terms denoting them, latinizing them. Along with this, another process was developing more actively – the formation of Latin terms. The main method of using Greek scientific and philosophical terminology among the Romans was tracing, both word-buiding – the formation of a new Latin word according to the Greek model, and semantic – imparting the Latin word special meanings that the Greek word had acquired *(Tronskij, 2014: 85).*

Some idea of the Latin special vocabulary, in particular anatomical, can be drawn from the poem of the poet-philosopher Lucretius Cara (approx. 99–55 BC) "On the nature of things" ("De rerum natura"). Describing the structure of the human body, Lucretius used both the words of the literary Latin language and latinized borrowings from Greek. Some of

the names used in the poem are used in modern International Anatomical Nomenclature, for example: *membra (limbs), palatum (palate),* borrowed *brachium (shoulder).* Like the Greek anatomists, who designated both arteries and veins with the word *phleps, phlebos* in the general meaning of "vein", Lucretius used the equivalent Latin word *vena*, and for nerves, tendons and ligaments – the word *nervus*, from the Greek *neuron* – vein, applied to the same goals as early as Hippocrates and Herophilus *(Chikin, 1990: 157).*

The only surviving fully medical work of the ancient Romans, which contains references to the authority of Greek doctors, namely Hippocrates, Herophilus and Erasistratus, is the treatise "*De medicina*" ("*On Medicine*"). This work, which is a part of an extensive encyclopedic work that has not come down to us, was written in Latin by Aulus Cornelius Celsus in the 1-st century AD. The composition, which was considered irretrievably lost, was accidentally discovered in 1443, fifteen centuries after its creation, and from that time it became available for European medicine.

In his work, for the first time in Europe, Celsus outlined the doctrine of cataracts as an effusion in the pupillary region, which, as it thickens, causes visual impairment, and described its operation.

The special vocabulary used by Celsus, often with a refined, and sometimes with a modified meaning of words, almost completely entered the dictionary of professional medicine, becoming part of the international anatomical nomenclatures of the late 19th – mid-20th centuries. For example: *abdomen* (in modern English terminology – *abdomen*) – the abdominal cavity, *stomach*; *articulus* (articulation) – joint; *cartilago* – cartilage; *cervix* – neck; *cubitus* (cubit) – ulna; *digitus* – finger; *index* – index finger; *intestinum* – intestines; *medulla* – brain (in Celsus – bone marrow); *oculus* – eye; *pulmo* – light; *ren* – kidney; *tonsilla* -tonsil; *vertebra* – vertebra, etc .

To a lesser extent, the existing medical terminology includes Latin names of diseases and their symptoms, for example: *acutus morbus* (acute morbus) – an acute disease; *cancer*; *delirium* – disorder of consciousness; *febris* (febricity) – fever, *fractura* – fracture; *papula* – papule; *remissio* – remission; *tumor* – swelling; *tussis* – cough; *varix* – expansion, swelling of the veins; *verruca* – wart.

Since in the era of Celsus Latin medical terms were still in their infancy, he often used the same word to express different concepts: *vulnus* – 1) wound; 2) ulcer; *cancer* – 1) cancers; 2) necrosis; *Ignis sacer* – 1) herpes zoster; 2) acute inflammatory disease such as gastritis *(Cels, 1959: 6).*

I.Ya. Geiberg, noting the merits of Celsus in presenting the achievements of surgery of the Alexandrian period, characterized the entire work as follows: “Medicine gave in 1-st century AD gratifyingly striking work – a small reference book by Cornellius Celsus – the best that the Romans contributed to all scientific literature" *(Cels, 1959: 8).*

Some contribution to the expansion of medical vocabulary was made by the Roman writer Pliny the Elder (23 – 79 AD) with his essay “*Naturalis historia*” (“Natural History”). So, he introduced the word *tinea* (worm) as the name of some skin diseases, and also latinized some Greek terms, for example, the term *paracentesis* (from Greek *parakentēsis*) that has survived to this day *(Shulc, 2012: 10).*

Since Greek and Latin were territorially and historically interacting languages, the missing designations were borrowed by Latin from Greek and easily assimilated into it. At the same time, a number of Greekisms retained their form completely, being transcribed using the Latin alphabet, taking into account the peculiarities of Greek letters. So, the sounds indicated by the Greek letters χ (chi), φ (phi) and υ (theta) were transmitted by the Romans respectively

by the digraphs ch, ph, th: χοριου – chorion, φλεγμαυια – phlegmasia, υωραξ – thorax. The combination of Greek letters σχ (sigma, chi) was transmitted as sch, for example: σχήμα – schema. The initial sound, denoted by the Greek letter ρ (ro), was transmitted in Latin by the digraph rh, for example, ρωτις – rhinitis, and received an additional ρ as a part of derivative words, for example: αιμορραγια – haemorrhagia. The Greek diphthong αι was transmitted by the Latin ae; Greek οι – Latin oe; ει with letter i or digraph ei; αυ – au; eu – ευ. So, for example, the terms *gangraena, therapia, aura, pneumonia*, etc. were transferred from Greek to Latin... The Greek letter κ was usually transcribed with the letter c, which was read in classical Latin as [k]. However, over time, a double reading of the letter c arose: as [k] – before a, o, u, before consonants and at the end of a word, as [ts] – before e, i, y, ae, oe. In words of Greek origin that have undergone romanization or other transcription in Western European languages, the Greek letter κ was read in two ways. Thus, from the Greek κεφαλή (head) not only the terms *cephalography* (English *cephalography*), *cephalhematoma* (English *cephal (o) hematoma*) were produced, but also *cephalometry, cephalocem* etc.

Sometimes latinization affected word forms: instead of Greek endings *-ος*, *– ου*, Latin *-us, -um* were used, for example: πιλωρυς – pylorus, βραχιωυ – brachium. Among the latinized Greek words that have survived to this day, one can find the following: *bronchus* – in its original meaning – a breathing tube; *carpus* – wrist; *hepar* – liver; *larynx* – larynx; *necrosis* – necrosis; *pancreas* – pancreas; *paralysis* – -paralysis; *pharynx* – pharynx; *propolis* – bee glue; *thorax* – chest *(Chernyavskij, 1997: 262).*

Borrowings took root rather quickly, since most of the medical practitioners in Rome were Greeks.

Of these, Rufus of Ephesus (1st – 2nd century AD) showed great interest in the issues of medical terminology. He wrote a small manual "On naming parts of the human body" for students of anatomy. Ruf coined the term *diploe* to refer to the spongy core of the bone. Another Greek physician Areteus of Cappadocia (1-st or 2-nd century AD) is credited with introducing the term *diabetes* into the medical lexicon. The names of *eczema* (English *eczema*) and *trachoma* (English *trachoma*) were first found in the writings of Dioscorides of Cilicia (1-st century AD).

The creative heritage of the Greek physician, anatomist, pharmacologist, philosopher Claudius Galen had a huge impact on the subsequent development of ancient and post-antique medicine. He compiled a dictionary and commentaries on the writings of Hippocrates, introduced many new Greek terms, clarified the meaning of old ones, and revived Hippocratic terms that were almost forgotten or obscure to his contemporaries. Galen is the author of such new terms for his time as *thalamus* – lat. *thalamus* (optic tubercle of the brain), *peristalticē kinesis* – peristalsis, etc. *(Encyclopedicheskij slovar medicinskikh terminov, 1982:31).* At the initial stage, Galen's approach contained the main requirements that later began to be made to scientific terms, namely, the accuracy and unambiguity of interpretation.

5. Conclusions

In the countries of the European and American regions, Greek and Latin have traditionally been recognized as the main sources of replenishment of biomedical and the vast majority of new designations introduced into the language of medicine for the first time were words of Greek or Latin origin. Along with the names that were borrowed from the dictionaries of classical languages in finished form, neoclassicisms (neo-Greekisms and neo-Latinisms) began to appear in large numbers, artificially created by scientists from different countries on the basis of the lexical and derivational material of classical languages. The specific linguistic design of

neoclassicisms took place in different ways: they were formalized in Latin or received the form of one or another national language. Thanks to the Greek-Latin etymology, such terms easily penetrated into the terminology of various national languages and, modified in accordance with their phonetic and morphological systems, turned into international names – internationalisms.

References

1. Zabludovskij P.E., Kryuchok G.R., Kuzmin M.K., Levit M.M. (1981) Istoriya medicini [History of Medicine]. Moscow: Medicina, 352 p.
2. Zakalyuzhnij M.M., Andreichin M.F. (1993) Posibnik z anatomichnoj i klinichnoj terminologii [Manual on anatomical and clinical terminology]. Kyiv: Zdorov'ya, 224 p.
3. Yu.F.Shulc (2012) Medicina v pam'yatnikakh latinskoj I grecheskoj literatury / Teksti I kommentarii. [Medicine in the monuments of the Latin and Greek literature/ Texts and commentaries]. Moscow, 271 p.
4. Multanovskij M.P. (1967) Istorija medicini. [History of Medicine]. Moscow: Medicina, 345 p.
5. Tronskiy I.M. (2014) Voprosi yazikovogo razvitija v antichnom obtscestve. [Questions of language development in Ancient society]. Moscow: Lobrokon, 207 p.
6. Cels Avl Kornellij (1959). O medicine. Perevod s Latinskogo. / Pod redakciej V.N.Ternovskogo I Yu.F.Shulca. [About Medicine. Translation from Latin]. M.: Prosveschenie. 407 c.
7. Chernyavskij M.N. (1997) Latinskij yazik I osnovy meditsinskoy terminologii. [The Latin language and basics of medical terminology]. Moscow: Medicina, 336 p.
8. Chikin S.Ya. (1990). Vrachi-filosophi [Doctors-philosophers]. Moscow: Medicina, 383 p.
9. Encyklopedicheskij slovar medicinskikh terminov: v 3-kh tomakh. /Gl. redaktor B.V. Petrovskij. (1982) [Encyclopedia of medical terms in three volumes]. Moscow: Medicina.
10. Dorland's illustrated medical dictionary. /Ed 28. London, W.B. Saunders Comp., 1994. – 1940 p.