

A COMPARATIVE ANALYSIS OF TERM-FORMATION IN THE FIELD OF EARTH SCIENCES: TERMINOLOGIZATION AND RETERMINOLOGIZATION

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Abstract

The paper examines terminology in the field of earth science (geology) in the Albanian language. Comparisons are drawn with English language as an approach to terminology processing and language planning. The paper focuses on the similarities, differences as well as on the process of term-formation in both languages by throwing light on the linguistic means and ways available to both languages to create terms in the field when necessary. The data corpus consists of a number of terms lifted from the multi-lingual dictionary of geology (Tirana, 1988) published in the Albanian language. The analysis shows that terms in geology are chiefly attributed to foreign influence with many words borrowed from Neo-Latin languages. The analysis also shows that Albanian earth science terminology is to a greater extent characterised by the proliferation of Anglicisms as an unavoidable linguistic development common across many other languages. Nevertheless, terminology in the field of earth sciences in Albanian seems to share a set of other characteristics: a borrowed term and a domestic one usually exist in parallel with each other, some of the domestic terms seem to have sprung into use from the Albanian language itself through the process of terminologization and reterminologization, while others have been albanianized by fully adapting to the Albanian phonetic and morphological systems

Keywords: term-formation, borrowed term, terminologization.

Introduction

Earth sciences involve the study of the physical history of the earth, from its beginnings to the present day¹⁸. It was not until the 17th century that earth sciences made great strides in their development. At this time (20th century), earth sciences became their own entity in the world of natural science¹⁹. Earth sciences, as a specific science in Albania, began to develop rapidly right after the Second World War, which coincided with the liberation of the country. During the ensuing period (1945-1990), many works, scientific reports, articles, papers, earth science dictionaries contributed to the establishment of the geological terminology alongside other terminologies. The increase of geological research brought about the creation of many new Albanian terms in the field. The work of terminologists was crowned successfully with the compilation of the 'Dictionary of Earth Science Terms' with about 1400 terms in 1963, as part of the work for the compilation of a series of dictionaries of technical-scientific terms²⁰. The second attempt at dictionary making was just as successful in 1988 with the publication of the multi-lingual dictionary comprising some 9 500 geological terms. Like other fields of knowledge and science the number of terms denoting concepts within the field started growing rapidly because of the need to name new concepts in the field with the ongoing exploration and exploitation of Albanian soil which, by all

¹⁸ <http://www.bgs.ac.uk/vacancies/studying.htm>

¹⁹ http://en.wikipedia.org/wiki/History_of_geology#CITEREFJardineSecordSparv1996

²⁰ Forward. Dictionary of Terms of Geology. (1988)

accounts, is rich in natural resources. The rapid development and the special nature of earth sciences brought to the fore the need for working out a broad, exact and well-defined terminology. As Sager (1990) has observed some scientific disciplines are concerned with the observation and description of large numbers of natural phenomena. This is the case for the biological sciences, earth sciences, including mineralogy and other related areas. In addition, meaningful generalizations can be drawn by classifying the great multiplicity of objects, their characteristics, their common features, their use and adaptability to human needs. In this way one is to gain a useful and structured knowledge of the field in question. For purposes of naming new concepts the Albanian language uses a number of linguistic means and methods to name such concepts including, but not necessarily limited to, (1) borrowing words from other languages in contact; (2) borrowing words from neo-Latin languages; (3) borrowing words from ‘high status’ or ‘dominant’ languages like English, German and French, and (4) borrowing words from within the stock of the Albanian language through ‘internal borrowing’ or terminologization and reterminologization.

Typology of term classification in the field of earth sciences

At a more detailed level of analysis, different subject fields including the field of earth sciences may require different types of substructures in order to account fully for the diversity of concepts with which they operate. The relationships between concepts falling under the same field, as the one above, establish a hierarchical order identifying concepts as belonging to the same category in which there is a broader (generic) concept which is said to be superordinate to the narrower (specific) subordinated concept or concepts (Sager, 1990). The relationships between terms in earth sciences in both languages entail a vertical classification with several layers which is represented by the following terms (1) Terms denoting dynamic geology and geomorphology: njelmisht (Eng. saline); lakuriqje e relievit (Eng. relief denudation); akullnajë ndërmallore (eng. intermontane glacier) akulluar (Eng. glacierized); (2) Terms denoting geochemistry: diagramë gjeokimike (Eng. geochemical diagram); (3) Terms denoting hydrogeology and engineering geology: drenim sipërfaqësor (Eng. surface drainage); depërtueshmëria (Eng. penetrability). (4) Terms denoting magmatism, volcanism and metamorphism: jashtëdhedhje (Eng. ejection); lapil (Eng. lapille); metamorfizëm dinamotermal (Eng. dynamothermal metamorphism); piroklastik (Eng. pyroclastic); intruzion shtresor (Eng. layered intrusion). (5) Terms denoting mineralogy: agat zijosh (Eng. clouded agate); njëboshtor (Eng. uniaxial); patejdukshëm (Eng. opaque); jetmanit (Eng. yeatmainite); embolit (Eng. embolite). (6) Terms denoting petroleum geology: jociklik (Eng. acyclic); bitum (Eng. bitumen); elaterit (eng. elaterite); faktor gazor (eng. gas factor). (7) Terms denoting petrology and sedimentology: dymalit (Eng. dymalite); greizen (Eng. greisen); kamptonit (Eng. camptonite); alotriomorf (Eng. allotriomorphic); ampelit (Eng. ampelite). A huge number of Albanian terms have been introduced in the fields of petrology, petrography, sedimentology, mineralogy etc. Tectonics, as the most important branch of geology, is represented by a greater number of terms, especially those that represent recent notions, such as buzinë kontinentale (Eng. continental margin), hark ishullor (Eng. island arc), hulli (Eng. trench); kurrizore mesoqeanike (Eng. middleoceanic ridge), rravgim i kontinenteve (Eng. continental drift). On the other hand, some terms, which have recently come into use and which are connected with plate tectonics, have been given in the international form in which they appear in the geological literature such as ‘rift’ “Eng. rift”, obduksion (Eng. obduction); subduksion (Eng. subduction) etc., just as in the case of international terms for names of minerals, rocks, stratigraphic units including terms of the type like joderit (Eng. yoderite), izotopic “Eng. isotopic”, jetmanit (Eng. yeatmanite”, lugarit (Eng. lugarite”, ludvigit (Eng. ludwigite); renardit (Eng. renardite)’ selanit (Eng. selanite).

Main characteristics of term-formation in the field of earth sciences

For the beginning, it is important to mention that all terms are created by means of different structural and semantic peculiarities and patterns therefore we have to study these patterns and peculiarities. The creation of terms is a phenomenon studied, analyzed and used by many specialists. According to Poparcea (2011) term formation is a process of creating new terms from the material available in the language after certain structural and semantic formulas and patterns. It should be pointed out that the majority of earth science terms in use upon the Liberation of Albania were borrowed chiefly from the Neo-Latin languages consisting of the following stand-out terms, which are retained as such in the dictionary to this day and age.

Albanian	Neo-Latin languages
argjilë	clay
dislokacion tektonik	tectonic dislocation
nivel hidrostatik	hydrostatic level
falie	fault
inklinacion	inclination
karrexhiament	carriage
lëvizje plikative	plicative movement

In the beginning of the 60-s more Albanian words began to be used as terms such as: *hedhje* (Eng. *fault*), *ranor* (Eng. *sandstone*); *shkëmb* (Eng. *rock*); and the old linguistic means of the Albanian language were used to create new terms, often through translated loan-words such as: *mineral i dobishëm* (Eng. *economic mineral*); *vendburim* (Eng. *deposit*); *material ndërtimi* (Eng. *construction material*); *kënetë e varur* (eng. *suspended march*); etc. The process of substituting foreign words with words from within the Albanian language went unabated for long periods of time, aided and abetted by the linguistic means that Albanian has used since in its own early origins. This marked an important step towards the unification of terms of various domains of earth sciences. It included such terms as *bosht* instead of *aks* (Eng. *axis*); *brejtje* instead of *korrozion* (Eng. *corrosion*); *deltine* instead of *argjilë* (Eng. *clay*); *gatirrafshinë* instead of *penepelen* (Eng. *penepelen*); *gëlqeror* instead of *kalkar* (Eng. *limestone*); *lakesë* instead of *fleksurë* (Eng. *flexure*); *lyshter* instead of *aluvion* “Eng. *alluvion*” etc²¹. In this process of term formation *affixation* has been very active and productive. Based on the above, affixation is seen as a two-way process that consists of the use of prefixes and suffixes. Let us examine this process through the following examples:

Terms created through the process of prefixation:

Albanian	English
rrudhë e rirrudhosur	refolded fold (adj + n)
mbigrup	overthrust (n)
mbetje e patretshme	insoluble residue (adj + n)
bllok i mbihapur	overthrusted block (adj + n)

²¹ Forward to dictionary of geology, Tirana, 1988.

Terms created through suffixation:

Albanian	English
kristalizim dytësor	forcible crystallization (adj + n)
rënie përputhëse	conformable dip (adj + n)
skelet strukturor	structural framework (adj + n)
pjekuri strukturore	textural maturity (adj + n)

As the above examples show, the prefixes and suffixes have been effectively used in the denomination of the majority of international chronostratigraphic units of the lower and higher order - the stages (such as *akuitanian*, *mesinian*, *kimerxhian* etc). Such geological terminology reflected the new notions which entered the geological sciences especially in the 80s with the scientific changes that were underway.

The process of terminologization in Albanian and English language

Many words do double duty as words in general language and terms in special language, e.g. *platform*, which is a familiar word in general language, is used as a term in more than one domain, e.g., *railway platform* (transportation), *political platform* (politics), *drilling platform* (oil and mining), *weapons platform* (military), *launching platform* (space exploration). These are instances of *terminologization* or the *process of metaphorical extension* of the general-language notion to a more precise concept within a special-language domain (Wright & Budin 2001). The process whereby common language expressions are given more specific or metaphorical meanings in the technical contexts is called "*terminologization*" (Wallner, et al. 2010). The terminologization of a word implies endowing the word in question, over and above its existing semantic value, with a specific meaning which, corresponds to a specific concept within a special subject field. In this way the word acquires the status and characteristics of a term. It now belongs to a subject field and is part of the system of terms. This process takes place without changing the semantic value, which the word has in LGP. In other words terminologization is the way of forming new terms from the existing sources, it means from words that activate in the vocabulary of the language (Poparcea, 2011). According to Picht and Antia (2007) in most cases semantic motivation is associated with term creation procedures such as *terminologization* or *transdisciplinary borrowing*, leading to *homonymy* across subject fields. Terminologization is quite productive in Albanian language where common, ordinary words take on additional meanings to denote a new sense in the field of science and technology. In the process of terminologization we observe an increase in the volume of meanings with some meanings pertaining to a number of fields of science. To be more specific, the number of words extracted from the dictionary shows a process that has seen a huge number of ordinary Albanian words raised to geological terms in accordance with rules of Albanian word-building, thus replacing many foreign terms which appear across many texts and articles/papers. The process of terminologization in Albanian language can be classified as: (1) common words standing for parts of buildings lifted to the status of technical terms (2) common words denoting parts of the human anatomy raised to the status of technical terms.

Common words standing for parts of the building raised to the status of terms

Because of similarities in function and forms many words denoting parts of the buildings have been raised to a technical status to denote terms pertaining to the field of earth sciences. In fact, such process of term-formation is also common in many other fields of science and technology. For example the word ‘*chamber*’ is used as a term standing for government, politics and diplomacy meaning “*a reception room or audience room in an official residence, palace, etc legislative chamber*”; the term ‘*chamber*’ is also used in transportation denoting “*the space between two gates of the locks of a canal, dry dock, etc.*”. The term is also used in military to denote “*an enclosure for a cartridge in the cylinder of a revolver or for a shell in the breech of a cannon as in un chamber*” as well as in music used in combinations of the type ‘*chamber music*’ or ‘*a chamber concert*’. The following are words denoting parts of the building raised to a technical meaning used in combinations with other words in the field of earth sciences: *oxhak* (Eng. *pipe/chimney in house*) → is used in earth sciences in combinations of the type *oxhak copëzor* (Eng. *clastic pipe*); *oxhak vullkani* (Eng. *volcanic chimney*); *oxhak xeherori* (Eng. *ore chimney*); *çati* (Eng. *roof*) → is used in earth sciences as *çati gjeologjike* (Eng. *geological roof*); *dritare* (Eng. *window*) → *dritare karstike* (Eng. *karst window*); *dritare tektonike* (Eng. *tectonic window*); *dysHEME* (Eng. *floor; pavement*) → is used in earth science terminology as *dysHEME akullnajore* (Eng. *glacial pavement*); *dysHEME me curra* (Eng. *boulder pavement*); *dhomë* (Eng. *chamber*) → is used in earth science terminology as *dhomë magme* (Eng. *magma chamber*); *shtresë* (eng. *bed*) → *shtresë e poshtme* (Eng. *lower bed*); *shtresë e pjerrët* (Eng. *steep bed*).

Common words denoting parts of the human anatomy raised to the status of technical terms

The following words denoting parts of the body, because of the similarities in position and functionality, have been borrowed from within the stock of Albanian language to denote new concepts in the field of earth sciences. Internal borrowing from within the stock of Albanian language is very productive in Albanian language. There are obvious advantages to this process of term-formation, since common words falling under the same dictionary entry, take on scientific meanings, thus not adding to the burden of dictionaries with an endless number of word entries anytime there is a need to name new discoveries or phenomena which have grown steadily in the age of new technological and scientific discoveries (*exploration and exploitation techniques*). The following are examples of words denoting parts of the human anatomy raised to the status of technical terms bearing resemblance to the *source* word: *damar* (Eng. *vein in humans*) → is used in earth science terminology in combinations of the type as *damar* (Eng. *vein in minerals*); *dell intruziv* (Eng. *intrusive vein*); *trup* (Eng. *body in humans*) → *trup minerar* (Eng. *ore body*); *krah* (Eng. *limb in humans*) → *krah i pjerrët* (Eng. *steep limb*); *krah i përmbysur* (Eng. *overturned limb*); *krah antiklinali* (Eng. *anticlina limb*); *skelet* (Eng. *skeleton in humans*) → *skelet kristali* (Eng. *skeleton of crystal*); *fshikëz* (Eng. *vesicular*) → *strukturë fshikëzore* (Eng. *vesicular structure*); *kurrizore* (Eng. *ridge as in ridge of nose*) → *kurrizore oqeanike* (Eng. *oceanic ridge*); *fund* (Eng. *bottom*) → *fund i cekët* (Eng. *shallow bottom*); *fund ranor* (Eng. *sandy bottom*); *hundë* (Eng. *nose*) → *hundë strukturore* (Eng. *structural nose*); *hundë monoklinale* (Eng. *monocline nose*).

The process of reterminologization in term-formation

Reterminologization is a process of new term creation from the terms already existing in the language but, the point is that in different domains the term has different meanings, that is a term is used in economy, for example, and in law but its meaning differs in every other sphere. The following five instances show how words standing for sciences such as *geometry*, *general mechanics*, *economics*, *civil engineering* and *military* have been borrowed to

denote new terms in *earth sciences*: (1) Words borrowed from geometry to denote a geological term: *gjashtëkëndësh* (Eng. *hexagonal*) → *sistem gjashtëkëndësh* (Eng. *hexagonal system*); *katërkëndësh* (Eng. *tetragonal*) → *sistem katërkëndësh* (Eng. *tetragonal system*); *trekëndësh* (Eng. *trigonal*) → *sistem trekëndësh* (Eng. *trigonal system*); *dypiramidë* (Eng. *dipyramide*) → *dypiramidë rombike* (Eng. *rhombic dipyramide*); (2) Words borrowed from general mechanics to denote geological terms: *bërthamë* (Eng. *core*) → *bërthamë antiklinale* (Eng. *core of anticline*); *bërthamë e brendshme* (Eng. *inner core*); *bërthamë e jashtme* (Eng. *external core*); *bërthamë e tokës* (Eng. *earth core*); *bosht* (Eng. *axis*) → *bosht binjakëzimi* (Eng. *twinning axis*); *bosht lugine* (Eng. *valley axis*); *bosht menteshe* (Eng. *hinge axis*). (3) Words borrowed from economics to denote geological terms: *rezervë* (Eng. *reserve*) → *rezervë gjeologjike* (Eng. *geological reserve*); *rezervë naftë* (oil reserves); *rezerva potencial* (Eng. *potential reserve*); *depozitë* (eng. *deposits*) → *depozitim sipërfaqësor* (Eng. *superficial deposit*); *depozitim i përsëritur* (Eng. *recurrent deposition*); (4) Words borrowed from civil engineering to denote geological terms: *bllok* (eng. *block*) → *bllok hedhësh* (Eng. *fault block*); *bllok i kores së tokës* (Eng. *crustal block*); *bllok i ngritur* (Eng. *uplifted block*); *nëndarje* (eng. *subdivision*) → *nëndarje stratigrafike* (Eng. *stratigraphic subdivision*); *taban* (eng. *bottom*) → *taban i detit* (Eng. *sea bottom*); (5) Words borrowed from military to denote geological terms: *shtysë* (Eng. *push*) → *shtysë tektonike* (eng. *tectonic push*); *vrojtim* (Eng. *observation tower*) → *pus vrojtimi* (Eng. *observation well*); *kurth* (Eng. *trap*) → *kurth hedhësh* (Eng. *fault trap*); *kurth gazi* (Eng. *gas trap*); *gjurmëlënës* (Eng. *tracer*) → *gjurmëlënës* (Eng. *tracer*).

Synonymy and geological terms

Although synonymy in the field of geology is not recommended, its occurrence is almost unavoidable. They (synonyms) in the field of science and technology exist in the language despite allegations to the contrary. Most terminologists agree on one thing: ‘*synonymy adds a burden to memory and terms should denote one concept and one concept alone*’. The presence of two words denoting the same thing adds to ambiguity and confusion as well as misunderstanding among specialists in the field. It is established that concepts are universal across languages: the terms “*fold flank*” in English, ‘*flanc de pli*’ in French and ‘*fianco di piega*’ in Italian express the same concept across these three languages. Yet, the wording or the phonetic alignments differ to fit in with the phonetic system of each of the languages prescribed above. Synonymy occurs mostly in languages in contact, or because of the heavy influence of Greek and Latin languages and because of the rapid advancements in the industrialized world which uses English as the language of science. Hence, most of the words are transposed into other languages directly from English language finding their way into the ‘*borrowed stratum*’ of languages. Most often synonymous terms occur in pairs or they form even string of synonyms. In such cases one of the terms depicts its meaning in a more comprehensive manner capturing the meaning fully. The following is a list of synonyms in English in the field of geology: *Pruned crystal - immature crystal* (Alb. *kristal i shkurtuar*); *gas factor -gas-oil ratio* (Alb. *faktor gazi*); *heave -strike slip-horizontal throw -horizontal displacement* (Alb. *gjani horizontale*); *decorative stone -ornamental stone* (Alb. *gur zbukurimi*). The terms in earth sciences are quite complex and there cannot be a thoroughly comprehensive study in the field unless further studies to examine polysemy, antonymy, semantics, morphological and phonetic structure are launched.

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