Constructing Microstructures
in A Comprehensive Etymological Dictionary
of the English Language (E. Klein)

Bolesław Cieślik[1]
Bożena Iwanowska[2]
Yan Kapranov[3]*
Olena Semenog[4]

[1]The University of the Commission of National Education in Cracow (Cracow, Poland), boleslaw.cieslik@up.krakow.pl
[2]The University of Economics and Human Sciences in Warsaw (Warsaw, Poland), b.iwanowska@vizja.pl
[3]The University of Economics and Human Sciences in Warsaw (Warsaw, Poland), y.kapranov@vizja.pl
[4]Sumy State A. S. Makarenko Pedagogical University (Sumy, Ukraine), olenasemenog@gmail.com
*Corresponding author: y.kapranov@vizja.pl
ORCID ID: https://orcid.org/0000-0003-2915-038X

ABSTRACT

ARTICLE HISTORY

This article examines the construction of microstructures in Ernest Klein's "Comprehensive Etymological Dictionary of the English Language" (CEDLE). It delves into the traditional and cognitive-comparative principles used in the compilation of etymological dictionaries, highlighting the integration of structural, functional, and cognitive linguistics in modern lexicography. The study emphasizes the significance of etymological dictionaries as repositories of linguistic evolution, exploring how etymons—original forms and meanings of words—are presented within CEDLE. It outlines the methods used to organize etymological data, including phonetic, morphological, historical, and ideographic rules, and demonstrates how these principles are applied to construct etymological microstructures. The article also introduces a heuristic model of etymological entries in the form of a fractal, reflecting the dynamic and evolving nature of etymological hypotheses. The research underscores the necessity of adopting novel approaches in etymological lexicography to facilitate a deeper understanding of language history and its cognitive and cultural factors.

1. Introduction.

Modern comparative-historical studies (Dickie, 2023; Lander, 2023; Petrovitz, 2023) exhibit a notable convergence with the domains of *comparative typology* (Yurayong et al., 2023) and *general linguistics* (Abalkheel et al., 2023). Recently, however, there has been a resurgence in addressing the contentious issues originally posed by classical linguistic comparative studies. These issues can now be more productively explored through integrating structuralism, functionalism, and linguistic cognitivism.

The theoretical principles governing the formation of **orthographic systems in Indo-European languages, which are** believed to reflect the characteristics of the proto-Indo-European language, remain a subject of debate and continued interest. Linguistic principles are traditionally associated with orthography and encompass phonetic, morphological, historical, etymological (traditional), and ideographic rules.

Ontologically, the phonetic principle was initially predominant in Indo-European languages, underpinning the formulation of early phonetic laws and regular sound change rules (Humboldt, 1975; Bopp, 1845). However, this principle has yet to maintain its dominance across all modern European languages. For instance, Russian orthography primarily adheres to *the morphological principle* (Shanskyi et al., 2000). In contrast, Ukrainian orthography upholds both *phonetic* and *morphological principles* (Plyushch, 2016), with *historical* and *etymological principles*, as proposed by Maksymovych (2004), failing to gain traction. Conversely, English orthography has integrated *historical* and *etymological principles* into its national orthographic system (Brown, 2015).

Etymological lexicography offers insights into these diverse orthographic principles, a field that gained prominence in the 19th century when phonetic laws became a focal point of comparative-historical linguistics (Anikin, 2023; Melnychuk, 1966). This context underscores the significance of etymological dictionaries, not merely as theoretical and applied lexicographic challenges but as repositories of continuous linguistic evolution from proto-language stages to their contemporary forms. This perspective allows for the consideration of etymological microstructures as critical sources for elucidating the rules and exceptions

underpinning English orthographic systems through the analysis of etymons—the original forms and meanings of words (Ayto, 1990; Partridge, 1958; Weekley, 1921).

Analyzing the scientific and analytical processes undertaken by the authors or compilers of etymological microstructures involves examining data organization within two primary areas: *the entry word area* and *the etymology area* (Vyvenko, 2000). This analysis can reveal the traditional principles underlying the presentation of etymological hypotheses in lexicography and the cognitive mechanisms involved in constructing an etymon. This, in turn, facilitates an understanding of the idealized models of linguistic states and the intrinsic connections between sound and meaning.

From this standpoint, the established notion that native language complexity precludes formalization is challenged. Etymological lexicography, therefore, necessitates the adoption of novel approaches and emerges as a promising avenue for contemporary cognitive and comparative research (Sweetser, 1991).

2. Literature Review.

In the linguistic tradition of lexicographic source studies, the internal structure of a word is viewed as an ontological constant reflecting the civilization, people, and personality (Karaulov, 1988). This perspective is enriched by contemporary cognitive approaches integrated with linguistic comparative studies, enabling a deeper understanding of individuals and societies. Additionally, this integration reveals information flows realized through the interrelationships between *language and consciousness* (Pinker, 2005), *language and history* (Humboldt, 1945), and *language and culture* (Sapir, 1978). These relationships are directly linked to the processes and mechanisms of categorizing and conceptualizing reality, forming the basis of speakers' worldviews across different languages, eras, ethnic groups, and subcultures.

This approach justifies the study of lexicographic sources by incorporating the achievements of *lexicographic theory* (Herd, 1997; Shcherba, 1974), *metalexicography* (Zmigrodzki, 2020), and *lexicographic practice* (Denisov, 1988). Modern lexicography employs a variety of lexicographic sources, and the emergence of modern editions contributes to the dictionary system (Dubichinskyi, 1998). This system is organized typologically into a hierarchy of type, subtype, class, subclass, kind, and variety.

Among these, ***the etymological dictionary*** (ED) merits particular attention. An ED is a unique linguistic reference system containing information about words' genetic links (etymology) within a specific language or group of related languages. The particular purpose of an ED dictates the multifaceted nature of lexicographic research problems, including *the types of lexicographic information as components of a unified language description* (Benveniste, 1935), *the challenges of etymological analysis* (Potebnia, 2007), *the motivation behind the internal form of words* (Vinogradov, 1977), *the morphological criteria in word formation* (Otkupshchikov, 2005), *the stages of lexicographic arrangement* (Kotorova et al., 2019), and *the principles for summarizing vocabulary information to model language content* (Geeraerts, 1989).

Building on the works above, three primary directions have emerged in lexicography: (a) ***epistemological***, i.e., viewing dictionaries as methods of organizing and presenting society's accumulated knowledge (Burkhanov, 1998; Sterkenburg, 2003); (b) ***historical and philological***, i.e., developing a typology of dictionaries (Malkiel, 1993); (c) ***semantic-epistemological***, i.e., addressing the principles for summarizing vocabulary information as a strategy for lexicographic modeling of language content (Geeraerts, 1989).

The tradition of compiling etymological dictionaries indicates that lexicographers often relied on the mechanical processing of genetic data material. Despite advances in artificial intelligence, modern lexicography seeks to incorporate the achievements of computational linguistics. This has given rise to the field of computer lexicography, which enables the automatic generation of word lists and definitions without human intervention.

In this context, it is pertinent to utilize corpus linguistics resources, mainly when dealing with etymology, to enhance the accuracy and depth of etymological dictionaries.

3. Aim and Objectives.

This article delineates traditional principles and commends cognitive-comparative principles in constructing etymological microstructures, using examples from "A Comprehensive Etymological Dictionary of the English Language" (E. Klein).

Objectives:

– to examine the traditional structure organization in linguistic dictionaries, explicitly focusing on the design and differences between mega- and macrostructures versus microstructure construction;

– to explore cognitive-comparative principles applied in the construction of etymological microstructures within modern lexicography;

– to analyze the traditional principles used for constructing etymological versions in "A Comprehensive Etymological Dictionary of the English Language" (E. Klein);

– to investigate the cognitive-synergistic principles employed in constructing etymological microstructures in "A Comprehensive Etymological Dictionary of the English Language" (E. Klein).

4. Traditional Structure Organization in Linguistic Dictionaries: Designing Mega- and Macrostructures vs. Microstructure Construction.

The lexicographic theory and practice of both past and present illustrate that one of the primary challenges in lexicography is the terminological framework or the principles guiding lexicographers in systematizing data material. Terms such as *stacking* (Ozhegov, 1997), *modeling* (Horodetskyi, 1983), *parameterization* (Dubichinskyi, 1998), *design* (Kudashev, 2007), and *construction* (Karaulov, 1981) describe various stages of a lexicographer's work on a dictionary, highlighting the phased nature of *dictionary development* (Baranov, 2001; Dubichinskyi, 1998; Zgusta et al., 1971). Griniov (1986) suggests four stages, while Horodetskyi (1983) identifies ten, indicating significant variation in the level of detail considered at each stage.

A universally "effective" method for dictionary creation/compilation has yet to be established, as some lexicographers prefer to form a corpus of texts before developing the dictionary. In contrast, others integrate these processes (Andryushchenko et al., 1988). I. S. Kudashev (2007) supports this view, noting differences in computer versus paper dictionary approaches. The main reasons for disagreement on dictionary compilation stages include dependency on initial conditions, the optional nature of certain stages, the overlap and continuity of stages, and differing opinions on when a dictionary is complete. Consequently, it

is impossible to formalize a linear sequence of universally applicable stages in dictionary design/construction (Kudashev, 2007).

The concept of an "ideal dictionary" remains unattainable (Kudashev, 2007). The information organization in dictionaries can be complex and varied, as no typology or terminology exists. Researchers focus on the "ideal" dictionary model and the fundamental compositional components of mega-, macro-, micro-, and microstructures. Despite variations in lexicographic traditions and dictionary types, dictionaries consistently comprise two main parts: the macrostructure and the microstructure, each with distinct meanings and significant shortcomings (Kudashev, 2007).

According to R. R. K. Hartmann (2001), *the macrostructure* is "the principle of organizing dictionary articles in the main body of the dictionary" (p. 65). S. V. Griniov (1986) includes the composition and interaction of all dictionary parts within this concept, termed "megastructure" by R. R. K. Hartmann (2001) and "frame structure" by H. Bergenholtz and S. Tharp (1995). Proper organization of dictionary articles is termed "mediostructure" (Griniov, 1995), involving "different means of access to vocations" (Hartmann, 2001, p. 65). H. Bergenholtz and S. Tharp (1995) refer to this as "vocational structure" or "cross-reference structure".

The macrostructure follows general lexicographical principles, including antonyms, homonyms, synonyms, and thematic and lexico-semantic groups. ***The design stage of the dictionary*** is crucial for developing the macrostructure, which forms the dictionary's concept or megastructure. According to O. M. Demska (2010), this involves "a system of views on the status, type, purpose, scope, structure, principles for selection of described units, and the principles for their dictionary description" (p. 28). Each dictionary description is based on its principles and decisions despite the typicality of the lexicographic concept (Demska, 2010).

V. V. Dubichynskyi (1998) outlines the main design stages of mega- and macrostructures in linguistic dictionaries: (a) formation of the author's team; (b) creation of a dictionary project; (c) creation of a dictionary file (or computer data bank); (d) formation of the word register and systematization of lexical material; (e) development of the author's concept of the dictionary article structure; (f) direct lexicographic (automated, computer) interpretation of selected language units; (g) preparation of the dictionary for publication.

The second major issue is *constructing dictionary articles (micro texts), which are* part of the dictionary corpus (Kubryakova, 1995). The microstructure, as defined by H. E. Wiegand (1983), encompasses "the format, scope, and design of a dictionary article; the presentation of information about language units (etymological, encyclopedic, semantic, grammatical, word-forming, stylistic, and illustrative) described in the dictionary" (Wiegand, 1983, p. 14).

Yu. N. Karaulov (1981) describes ***linguistic construction*** as "a set of generalized methods and techniques for compiling and combining 'samples of problem-solving,' extrapolating existing theoretical and practical results in various linguistic areas, and using them to overcome difficulties and solve problems during the construction of new linguistic objects" (p. 16). The main factor in linguistic construction is determining "how to make" the object. For example, in an encyclopedia, this involves analyzing relationships between system languages, structuring transformed units, and establishing description criteria. Thus, linguistic construction creates new "things" and reveals essential aspects of linguistic material, involving analysis and synthesis stages (Karaulov, 1981).

The following two principles play a significant role: (a) non-distinction of ordinary language structure levels, allowing unconventional categorization of the object under investigation; (b) introducing new description units. An essential characteristic of these principles is the concept of "averaging," which is mandatory when building new objects involving substantial data (Karaulov, 1981).

A dictionary article is a completed independent unit that meets its goals. It combines information about the lexeme as an element of a specific word class while focusing on its features (Skibina, 1984). Yu. D. Apresyan describes a dictionary article as a "dictionary portrait," offering an exhaustive and redundant description of a lexeme's properties within an integral language description (cit. in Boguslavskyi, 2000).

5. Cognitive-Comparative Principles for Constructing Etymological Microstructure in Modern Lexicography.

Lexicographical practice reveals a nuanced trend in creating and organizing etymological sources, often distinguishing between "etymology" and "word history". O. B. Vayn (1990) explains this distinction: "There are many words 'without etymology' but with a vibrant history

and numerous semantic changes" (p. 12). He notes that "to describe the entire corpus of a language's vocabulary, an etymological dictionary must cover all significant aspects of a word's history and can thus be defined as historical etymological" (Vayn, 1990, p. 12).

S. O. Vyvenko (2000) observes that "clear rules for the construction of dictionary articles and the arrangement of material in etymological sources are absent" (p. 55). Constructing etymological microstructures in any language involves organizing two main areas (Vyvenko, 2000, pp. 56–57). In the entry word area, somewhat arbitrary information collected by the lexicographer can be traced. In the etymology area, lexicographic information is limited to the framework of the etymological description. K. Hoffmann and E. Tychy (1980) provide criteria for describing a dictionary article in etymological sources: (a) attestation of the title word; (b) written testimony; (c) lexical characteristics; (d) semantics; (e) reconstruction experience; (f) etymological connections (p. 47).

The first generation of comparativists understood language principles and associated them with *phonetic regularities of sound and language changes*. Young grammarians later formulated the principle of historicism, leading to the understanding of language as a science governed by regularities. These principles were established in orthography, a system of rules determining the writing of words according to established norms. This view aligns with the definition of "principles" in the dictionary of the Ukrainian language: "features/methods/rules that are the basis of creating or implementing something, or the way of creating or implementing something" (SUM 1976, vol. 7, p. 693).

Lexicography, as an independent field of linguistics, has its principles essential for lexicographers' scientific and practical activities when compiling any lexicographic source. The traditional principle of linguocentricity involves describing dictionary material at all levels, from phonetic to grammatical, as reflected in most dictionaries (Starikova, 2008). This principle deals with the heredity of lexicographical works, which consists of submitting comments of various natures to the language material using alphabetical, nested alphabetic, or nested submission methods.

An alternative in modern lexicography is the anthropocentric principle, which is oriented toward the user's parameters and requests for dictionary information. This principle considers

the needs and perspectives of dictionary users, tailoring lexicographic entries to be more accessible and relevant to contemporary audiences.

The cognitive-comparative approach to constructing etymological microstructures integrates cognitive science principles with comparative linguistics. This approach focuses on how speakers of different languages perceive and conceptualize reality, emphasizing the cognitive mechanisms involved in language use. It seeks to uncover the underlying mental processes that shape language and its evolution.

Key aspects of this approach include (a) *conceptualization and categorization, which is understanding* how different cultures and languages categorize and conceptualize the world. This involves examining the cognitive structures that influence language and meaning; (b) *historical and cultural context* that places the etymological data within historical and cultural contexts to understand how words and definitions have evolved; (c) *cognitive mechanisms* that identify the cognitive processes that underlie the formation and use of words, including metaphor, metonymy, and other cognitive tools; (d) *interdisciplinary integration* that combines the insights from cognitive science, psychology, anthropology, and linguistics to provide a comprehensive understanding of etymology.

By employing these principles, modern lexicographers can create etymological dictionaries that document the history and origin of words and provide insights into the cognitive and cultural factors that have shaped their development. This approach allows for a richer, more nuanced understanding of language, reflecting both its historical roots and its contemporary use.

7. Traditional Principles for Constructing Etymological Versions in "A Comprehensive Etymological Dictionary of the English Language" (E. Klein).

The concept of A Comprehensive Etymological Dictionary of the English Language (E. Klein) (CEDLE) is the organization of the external structure, or *mega-* and *macrostructure*, and the internal structure, or *microstructure.*

The megastructure of CEDLE consists of **eight sections**: Preface, Introduction, Rules for the Transliteration of Hebrew and Aramaic Employed in this Dictionary, Rules for the Transliteration of Arabic Employed in this Dictionary, Abbreviations of Books and Journals

Frequently Referred to, Other Literature Consulted, General Abbreviations, and Symbols used in this dictionary.

The macrostructure of CEDLE demonstrates the distinctive quantitative nature of the entry words included in the CEDLE corpus, consisting of hybrid words, proper words, and loanwords.

7.1. The Principle of Succession in the Process of Etymological Version Construction "A Comprehensive Etymological Dictionary of the English Language" (E. Klein).

In analyzing the microstructures of dictionaries, E. Klein's orientation to the main principles of lexicography (linguocentricity and anthropocentricity) demonstrates, in addition to lexicographic and linguistic heredity in the construction of etymological material, also an attitude to dialogue with a potential user of an etymological dictionary.

The heredity of lexicographical works can be traced directly using: 1) dictionary remarks: a) *referential*: cp. words referred to were "cp."– "compare"; b) *grammatical*: **acrid**, adj. (CEDEL, vol. 1, p. 18); **bicyclometer**, n. (CEDEL, vol. 1, p. 166), where "adj." – "adjective", "n." – "noun"; c) *terminological*: **chonolith**, n., a mess of igneous rock (*geol.*) (CEDEL, vol. 1, p. 281), where "geol." – "geological"; c) *chronological*: **cocker**, n., quiver (*obsol.*) (CEDEL, vol. 1, p. 307), where "obsol." – "obsolete"; 2) comments/clarifications (given in round () brackets): **deontology**, n. – "[...] it behoves one", and – λογῐᾱ, fr. λόγος, "one who speaks (in a certain manner); one who deals (with a certain topic)" (CEDEL, vol. 1, p. 427); 3) abbreviations: "fr." – "from", "prec." – "preceding".

The bibliography on etymology also corresponds to the etymological tradition or heredity. It enables etymologists to find out the limits of the variability of the relevant processes, chronologically close to the earliest state of the initial language of humanity, among which are ideas about the semantic and phonetic properties of linguistic units and regularities corresponding to later periods of language development, as well as regularities in the formation of the structure of the Indo-European root, which has been preserved in the form of relict phenomena: **inter**, prep., I.-E. *en-ter*, *ṇter* (in allusion to Revelations III, 14–16) (CEDEL, vol. 1, p. 804).

The linguocentricity can also be traced in presenting linguistic material: ***alphabetic*** and

nested. The method of constructing etymological microstructures corresponds *to the alphabetic principle.* At the same time, phonetic variants and word-forming derivatives of register words are presented in the etymology area. The desire for brevity led Klein to construct the material *nested* – by combining lexemes with the same root and genetically and semantically related by derivation relations. At the same time, CEDEL presents *one* degree of derivation or word-forming nest.

In CEDEL, mainly derivatives without prefixes are presented: phonetic variants and word-forming derivatives, i.e., derivatives of the registered word: **deontology**, n. – *deontology-ical*, adj., *deontology-ist*, n.

Derivatives without prefixes are grouped by parts of the language with the forms of the same part of the language to which the registered word belongs in the first place: **deontology**, n. – *deontology-ical*, adj., *deontology-ist*, n. The variants mentioned within each part of the language are presented alphabetically.

Not all CEDEL entries provide derivatives of their entry words. Most words are already diachronically derived or *diachronically derived* in the English language. These words were formed from previously existing words at one or another period of language development. The entry word **liner**, n. is derived from the splicing *line* "string, cord" and the suffix *-er* (CEDEL, vol. 2, p. 893).

This also applies to *unchanged words of foreign origin,* or *loanwords,* which were transferred from one language to another due to language contacts and the transition of elements of one language to another: **lignite**, n. – borrowing from the French language, which was formed from Latin *lignum* and the suffix *-ite* (CEDEL, vol. 2, p. 889); *hybrid words* are lexical units that were formed by combining two or more elements taken from different languages: **acetyl**, n. – A hybrid coined by the German chemist Justus von Liebig (1803–73) in 1839 fr. L. *acētum*, "vinegar" and **-yl**, a suff. of Greek origin (CEDEL, vol. 1, p. 14).

7.2. Etymological-Linguistic Principles for Construction of Microstructures "A Comprehensive Etymological Dictionary of the English Language" (E. Klein).

The etymological microstructures in CEDEL reflect a system of rules (regularities) based on *fundamental principles for English orthography*. The basis for the formation of etymological hypotheses remains the understanding of the essence of the main tasks and categories of functional orthography, their relationship with the functional aspects of language and speech, and the determination of regularities in the use of orthographic resources of the language, including phonetic, morphological, historical-etymological (traditional) and ideographic.

The path to the reconstruction of the etymon lies through the different presentation of phonetic variants and word-forming derivatives of register words presented in the <u>etymology area</u> in CEDEL, which reflect the rules:

– ***phonetic writing of words*** (words are written as they are pronounced): <u>phonetically long pronunciation</u> can be traced in the following phonetic variants: *field*, tr. and intr. v. (CEDEL, vol. 1, p. 589), where the combination *ld* indicates a long pronunciation of the preceding vowel; *boat*, tr. v. (CEDEL, vol. 1, p. 183), where the writing of the diphthong *oa* corresponds to the pronunciation [ou]; <u>phonetically short pronunciation</u>: *letter*, tr. v. (CEDEL, vol. 2, p. 882), *summer*, tr. and intr. v. (CEDEL, vol. 2, p. 1541) are two-syllable words in which the graphic doubling of the consonant letter conveys the short pronunciation of the vowel of the first syllable;

– ***morphological writing of words***, according to which the exact writing of the same morpheme does not depend on its pronunciation in one or another position: <u>nouns</u>: *pann-er*, n., *pann-ery*, n. (CEDEL, vol. 2, p. 1118); <u>adjectives</u>: *cancer-ous*, adj. (CEDEL, vol. 1, p. 230); <u>adverbs</u>: *cancer-ous-ly*, adv.; <u>verbs</u>: *dome*, tr., and intr. v. (CEDEL, vol. 1, p. 473).

The presentation of phonetic and morphological variants of registered words only in the area of etymology in CEDEL reflects the history of the phonetic principle of writing, characteristic of the period of the development of the English language in the 12th-century **semantic writing of words**, according to which, on the one hand, words are written based on understanding their lexical meaning or grammatical signs, and on the other hand, conveying

shades of meaning regardless of sound design. The semantic principle of writing is revealed using capital letters to distinguish proper names from common names: **hostensia**, n., the plant Hydrangea L.; **Hostensia**, fem. PN. (CEDEL, vol. 1, p. 744).

In the etymology area, the diachronic, or different time, path of the register word in historical development is highlighted. One of the structural elements of this zone is genetic material. In CEDEL, genetically related or etymologically related to the register words are submitted from other languages of the Indo-European family: **acrid** – L. *ācer* (fem. *ācris*, neut. *ācre*), "sharp, bitter", and *acidus*, "sour", L. *acus*, "needle", *aciēs*, "sharp edge, point, the front of an army, line of battle, battle array", *acuere*, "to sharpen", Oscan *acrid* (= L. *ācriter*), "sharply", Umbr. *per-acri*, "fruitful, fertile" […] (CEDEL, vol. 1, p. 18).

The historical (historical-etymological) writing of words, when words are written according to their origin, is generally a characteristic of English national orthography: **doubt** comes from ME *duten*, *douten*, OF. *duter*, *douter* (the modern form in the French language is *douter*), which were formed from the Latin form *dubitāre* "to be uncertain in opinion, that doubt"; historically, the letter *b* in the modern form *of doubt* was added somewhat later in connection with the etymological writing. At the same time, the Latin *dubitāre* means "to have that choose between two things". For a convincing explanation, the defendant from the German language *Zweifel is presented* as "doubt", where *two* means "two" (CEDEL, vol. 1, p. 477).

The organization of language material in dictionary articles also corresponds to the principles for comparative-historical linguistics: genetic, areal, historicism, and periodization.

The genetic principle can be traced in comparing the equivalents of only related languages, i.e., in the prohibition of going beyond the boundaries of the language family: **inter**, prep. – Ascan *anter*, Umbr. *anter*, *ander-*, OI. *antár*, Avestic *antar̆ĕ*, OPers. *antar*, "among, between", OI. *ántaraḥ*, "inner, interior", *āntrám*, "intestine", Toch. B *etsar*, "within", Arm. *ĕnder-kʿ* (pl.), "intestines", Gk. ἔντερα (pl.), "intestines" (CEDEL, vol. 1, p. 804).

The areal principle makes it possible to compare a registered word that has become part of English with its equivalent in any other language according to formal, formal-content, or purely semantic features to determine common and distinctive characteristics in the

reproduction of specific models of semantic development, derivational paradigms, and types, etc.: **bundook** – Hind., fr. Arab. *búnduq*, "missile", orig. "weapon made in Venice" (CEDEL, vol. 1, p. 209).

The historical principle strengthens etymological hypotheses: **restaurant**, n. – F. – Boulanger opened the first restaurant in Paris (Rue des Poulies) in 1765 and wrote over the entrance the Latin words *Venite ad me omnes qui stomach laboratis et ego vos restaurabo* (lit. "Come to me ye all that suffer from stomach and I will restore you") (CEDEL, vol. 2, p. 1335).

The principle of periodization was observed when establishing chronological boundaries in the historical periods of the development of register words of the English language. In CEDEL, for the English language, it is: 1) OE. – (V–XI centuries); 2) ME. – (XI–XIV centuries); 3) ModE. (XVII-XXI centuries).

8. Cognitive-Synergistic Principles for Constructing Etymological Microstructures in "A Comprehensive Etymological Dictionary of the English Language" (E. Klein).

The explanatory principle enabled the compilers to reconstruct the facts of the English language, not only to explain but also to underline the value of the explanation**.** *The expansion principle* combines the results of various sciences, *biology*, *zoology*, *ethnography/ethnology*, *history*, *mathematics*, *medicine*, *chemistry*, etc., to obtain an idea of human consciousness mind in direct connection with language.

All the principles together contributed to the construction of a heuristic model of the etymological microstructure in the form of a fractal – the shape of a circle (resembles a button with two holes), in the centre of which are the other two circles – two bifurcation points (the zone of the title word and the zone of etymology), where the "choice" of the further path takes place the development of the register word or the "selection" of stages of the construction of the iterative process – the way to restore the original form and meaning of the entry word (Fig. 1).

The basis for the etymology of each CEDEL register word is methodological settings (principles), which make it possible to trace the continuous chain of development of the etymon, starting from its primary state – the proto-language base (if possible, from the Proto-Indo-European language) in the zone of etymology (diachrony) – and ending the current state in the

area of the title word (synchrony). The development of the Proto-Indo-European root or joint base, which is the etymon (reconstructed form), is supported by its genealogy at a much deeper level by finding genetically related or etymologically related vocabulary from other Indo-European languages.

Such a collective lexical implementation of the counterparts in these languages, including their functioning in space and time, in the ramifications of derived words, makes it possible to reveal their semantic, in particular, diachronic potential, and thus to reproduce the paths and the very inner logic of language activity as a means of interpreting reality. Already from this point of view, the orientations change because the movement can take place in four directions, which by no means violate it: (1) involving historical data and establishing the periods of development of the entry word; (2) definition of the linguistic range (paths (directly / through mediation) and sources of borrowing the entry word) of the spread of the etymon; (3) clarification of etymological equivalents from Germanic languages to characterize the areas of distribution and use of the English word in closely related languages. Based on the already established etymon, phonetic variants and word-forming derivatives are separately derived in the CEDEL model.

Given that a fractal is the final result of an infinite procedure, articles in which the etymologies of their registered words have not yet been established are characterized by *dynamism*, *the ability to develop*. At each step of the iterative process, etymological hypotheses need new confirmations, which will probably be supplemented over time.
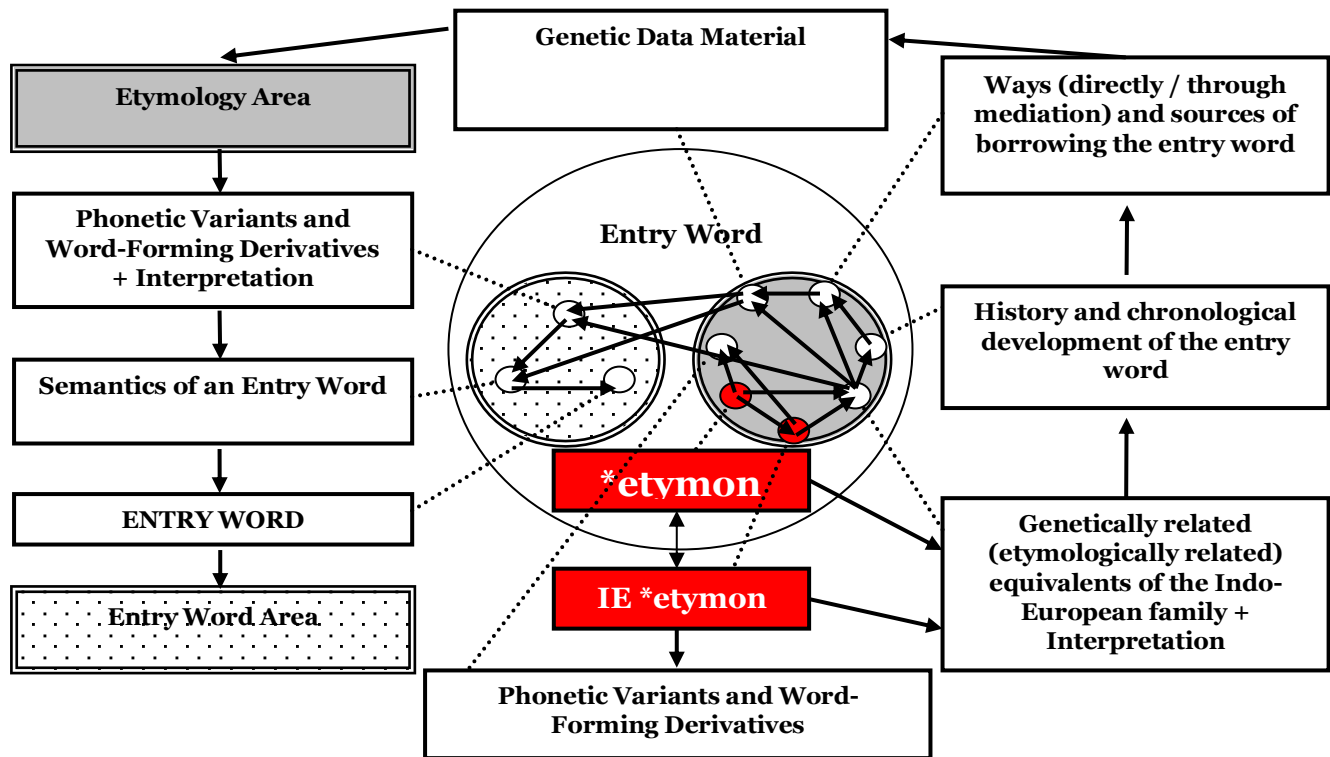
Fig. 1. **Etymological Microstructure in the Form of a Fractal**

8. Concluding Remarks.

The analysis of etymological microstructures reveals that their construction adheres to traditional linguistic principles of lexicography, which involve presenting vocabulary material from phonetics to grammar in alphabetical and nested formats. This adherence is evident in the presentation of remarks, comments, abbreviations, purely etymological information, and bibliographic references on etymological issues within the two main areas of dictionary articles in "A Comprehensive Etymological Dictionary of the English Language" (CEDEL) (E. Klein). A notable distinction in CEDEL is the construction of phonetic variants and word-forming derivatives by degrees of derivation, with a single word-forming nest in the etymology area.

Lexicographers and etymologists have constructed the pathway to reconstructing the etymon by following etymological-linguistic principles based on English writing system rules and the tradition of comparative-historical linguistics. English national orthography is rooted in historical and etymological principles, as evidenced by dictionary articles that include

phonetic variants and word-forming derivatives, exclusively presented in the etymology area. Separate words adhering to phonetic and morphological principles are also given there. Additionally, the semantic principle is reflected in the orthographic system of English, with entry word semantics presented synchronically in the entry word areas and diachronically in the etymology areas, illustrating the historical development of English.

The genetic principle, closely linked to comparative-historical linguistics, is evident in etymology, where equivalents from related languages are provided for etymon reconstruction. CEDEL equivalents genetically or etymologically related to other Indo-European languages are grouped into families. The areal principle, which pertains to the analysis of borrowed words, allows for comparing an English entry word with its equivalents in other languages, identifying common and distinctive characteristics when reproducing models of semantic development or derivational paradigms. Furthermore, the principles of historicism and periodization of English development are also observable in the etymology area.

Etymological microstructures were analyzed from modern linguists' attitudes toward expansionism and explanatory nature. This analysis resulted in a heuristic model of the etymon presented as a fractal, characterized by its dynamism and developmental capacity.

Future research prospects lie in the diachronic interpretation of etymological microstructures through corpus verification of entry words in historical contexts. This approach can further elucidate the evolution and development of etymons, contributing to a deeper understanding of language history and etymology.

Conflicts of Interest:
The authors declare no conflict of interest.

Disclaimer Statement:

The information, opinions, and views presented in the research article are solely those of the individual author(s) and contributor(s) and not of Acta Humanitatis, the Editorial Board, or its publishers. Acta Humanitatis and the editor(s) disclaim responsibility for any injury to people or property resulting from any ideas, methods, instructions, or products referred to in the content.

Author Bionote:

Dr. Bolesław Cieślik is an Assistant Professor at the Department of German Linguistics in the Institute of Neophilology at the University of the Commission of National Education in Cracow (Cracow, Poland).
The sphere of interest: German Studies, Lexicography, Translation Studies.
ORCID ID: https://orcid.org/0000-0001-9791-2994
Dr. Bożena Iwanowska is an Assistant Professor in the School of Social Sciences at the University of Economics and Human Sciences in Warsaw (Warsaw, Poland) and the Director of the UEHS Academic Center for Holocaust and Genocide Research.
The sphere of interest: English Philology, Holocaust and Genocide Studies, Lexicography, Translation Studies.
ORCID ID: https://orcid.org/0000-0003-1331-2866
Dr. Yan Kapranov is an Assistant Professor in the School of Humanities and Fine Arts at the University of Economics and Human Sciences in Warsaw (Warsaw, Poland).
The sphere of interest: Comparative / Macrocomparative Linguistics, Historical Linguistics, Global Etymologies, Corpus Linguistics, Multilingualism.
ORCID ID: https://orcid.org/0000-0003-2915-038X
Prof. Olena Semenog is the Head of the Department of the Ukrainian Language and Literature at Sumy State A. S. Makarenko Pedagogical University (Sumy, Ukraine)
The sphere of interest: Digital Technologies in Education, Lexicography, Ukrainian Studies.
ORCID ID: https://orcid.org/0000-0002-8697-8602

Authorship and Level of Contribution:

Dr. Bolesław Cieślik, Dr. Bożena Iwanowska, Dr. Yan Kapranov, and Prof. Olena Semenog contributed to the design and implementation of the research article, the analysis of the results, and the writing of the manuscript.

References

Abalkheel, A., & Sourani, M. (2023). Exploring the evolution of functional linguistics: linking Arabic theoretical linguistics with modern linguistics. *Cogent Arts & Humanities, 10*(1). http://doi.org/10.1080/23311983.2023.2207264

Andryushchenko, V. M., & Morkovkin, V. V. (1988). Bazovoye leksikograficheskoye znaniye i kompyuter [Basic lexicographic knowledge and computer.]. *Mashinnyy fond russkogo yazyka: predproyektnyye issledovaniya*, 4—41.

Anikin, A. E. (2023). From the history of words V. Turkisms in Russian dialects. *Sibirskii Filologicheskii Zhurnal, 1*, 243–256. http://doi.org/10.17223/18137083/82/18

Ayto, J. (1990). *Dictionary of Word Origins*. Arcade Publishing.

Baranov, A. N. (2001). *Vvedeniye v prikladnuyu lingvistiku* [Introduction to Applied Linguistics]. Editorial URSS.

Benveniste, E. (1935). *Origines de la formation des noms en indo-européen* [Origins of noun formation in Indo-European]. Librairie Adrien-Maisonneuve.

Bergenholtz, H., & Tarp, S. (1995). *Manual of Specialised Lexicography. The Preparation of Specialised Dictionaries*. John Benjamins.

Boguslavskyi, I. M. (2000). *Slovo v tekste i v slovare* [The word in the text and in the dictionary]. Yaz. rus. kulktury. (Studia philologica).

Bopp, F. (1845). *A comparative grammar of the Sanscrit, Zend, Greek, Latin, Lithuanian, Gothic, German, and Slavonic languages*. Madden.

Brown, P. (2015). Language, culture, and spatial cognition. In F. Sharifian (Ed.) *Routledge Handbook on Language and Culture* (pp. 294–309). Routledge.

Burkhanov, I. (1998). *Lexicography: A Dictionary of Basic Terminology*. Wydawnictwo Wyzszej Szkoly Pedagogicznej Rzeszów.

Demska, O. M. (2010). *Vstup do leksykohrafiyi* [Introduction to Lexicography]. Vyd. dim "Kyyevo-Mohylyanska akademiya".

Denisov, P. N. (1988). Yedinitsy slovarya [Dictionary Units]. *Natsionalnaya spetsifika yazyka i yeye otrazheniye v normativnom slovare*, 48—52.

Dickie, J. (2023). The name 'ndrangheta: history versus etymology. *Modern Italy, 28*(3), 215–229. http://doi.org/10.1017/mit.2023.17

Dubichynskyi, V. V. (1998). *Teoreticheskaya i prakticheskaya leksikografiya* [Theoretical and practical lexicography]. Wiener Slawisticher Almanac.

Geeraerts, D. (1989). Principles for Monolingual Lexicography. *Walter de Gruyter*.

Griniov, S. V. (1986). *Printsipy teorii leksikografii* [Principles for the theory of lexicography]. Izd-vo MGU.

Griniov, S. V. (1995). *Vvedeniye v terminografiyu* [Introduction to terminography]. Izd-vo MPU.

Hartmann, R. R. K. (2001). *Teaching and Researching Lexicography*. Longman.

Herd, A. S. (1997). K opredeleniyu ponyatiya "slovar" [On the Definition of the Concept "Dictionary"]. *Problemy leksikografii*, 191—203.

Hoffmann, K., & Tichy, E. (1980). Checkliste zur Aufstellung bzw. Beurteilung etymologischer Deutunge [Checklist for Establishing or Assessing Etymological Interpretations]. In M. Mayrhofer *Zur Gestaltung des etymologischen Wörterbuches einer "Großcorpus-Sprache"* (SS. 47–52). Verlag der Osterreichischen Akademie der Wissenschaften.

Horodetskyi, B. Yu. (1983). Problemy i metody sovremennoy leksikografii [Problems and methods of modern lexicography]. *Novoye v zarubezhnoy lingvistike, 14*, 5—22.

Humboldt, W. von (1945). *Über das vergleichende Sprachstudium in Beziehung auf die verschiedenen Epochen der Sprachentwicklung* [About the comparative study of language in relation to the different epochs of language development]. Meiner.

Karaulov, Yu. N. (1981). *Lingvisticheskoye konstruirovaniye i tezaurus literaturnogo yazyka* [Linguistic construction and thesaurus of literary language]. Nauka.

Karaulov, Yu. N. (1988). Sovremennoye sostoyaniye i tendentsii razvitiya russkoy leksikografii [Current state and development trends of Russian lexicography]. *Sovetskaya leksikografiya*, 5–18.

Kotorova, E., & Nefedov, A. (2019). Lexicographic Documentation of an Endangered Language: The Case. *Glocal Conference 2019 in Asia (THE CALA 2019)*, 440–447.

Kubryakova, Ye. S. (1995). Evolyutsiya lingvisticheskikh idey vo vtoroy polovine XX veka (opyt paradigmalnogo analiza) [The evolution of linguistic ideas in the second half of the 20th century (experience of paradigmatic analysis)]. *Yazyk i nauka kontsa XX veka*, 149—238.

Kudashev, I. S. (2007). *Proyektirovaniye perevodcheskikh slovarey spetsialnoy leksiki* [Design of Translation Dictionaries for Special Vocabulary]. Helsinki University.

Lander, E. T. (2023). Thoughts on the etymologies of enn and hinn in Nordic. *Nordic Journal of Linguistics*. http://doi.org/10.1017/S0332586522000270

Maksymovych, M. (2004). O pravopysanyy Malorossyyskoho yazyka: Pysmo k Osnovyanenko [On the Writing of the Malorossiysk Language: Letter to Osnovyanenko]. *Istoriya ukrayinskoho pravopysu XVI–XX*

stolittya. Khrestomatiya, 88–106.

Malkiel, Y. (1993). *Etymology*. Cambridge University Press.

Melnychuk, O. C. (1966). *Vstup do porivnyalno-istorychnoho vyvchennya slovyanskykh mov* [Introduction to the Comparative-Historical Study of Slavic Languages]. Naukova dumka.

Otkupshchikov, Yu. V. (2005). *K istokam slova Tekst: rasskazy o nauke etimologii* [On the Origins of the Word Text: Stories About the Science of Etymology]. Avalon: Azbuka-klassika.

Ozhegov, S. I. (1974). *Leksikologiya. Leksikografiya. Kultura rechi* [Lexicology. Lexicography. A Culture of Speech]. Vysshaya shkola.

Partridge, E. (1958). *A Short Etymological Dictionary of Modern English*. Routledge and Kegan Paul.

Petrovitz, W. (2023). The Seduction of Etymology: Heidegger's Philosophical Cognates. *Word Journal of the International Linguistic Association, 69*(1), 1–10. http://doi.org/10.1080/00437956.2022.2160146

Pinker, S. (2005). So How Does the Mind Work? *Mind and Language, 20*(1), 1–38. http://doi.org/10.1111/j.0268-1064.2005.00274.x

Plyushch, M. Ya. (2016). *Katehoriya vidminka v semantykosyntaksychniy strukturi rechennya* [Case Category in the Semantic-Syntactic Structure of the Sentence]. Vyd-vo Natsionalnoho pedahohichnoho un-tu imeni M. P. Drahomanova.

Potebnia, A. A. (2007). *Mysl i yazyk* [Thought and language]. Labirint.

Sapir, E. (1978). *Kultura, język, osobowość* [Culture, Language, Personality]. Państwowy Instytut Wydawniczy.

Shanskyi, H. M., & Bobrova, T. A. (2000). *Shkolnyy etimologicheskiy slovar russkogo yazyka: Proiskhozhdeniye slov* [School Etymological Dictionary of the Russian Language: Origin of Words]. Drofa.

Shcherba, L. V. (1974). Opyt obshchey teorii leksikografii (1940) [Experience in the General Theory of Lexicography (1940)]. *Yazykovaya sistema i rechevaya deyatelnost*, 97—116.

Skibina, V. I. (1984). *Teoriya i praktika leksikograficheskogo opisaniya slovarnogo sostava avstraliyskogo varianta angliyskogo yazyka* [Theory and Practice of Lexicographic Description of the Australian English Vocabulary] [Candidate's of Sciences Dissertation]. Kyivskyi gosudarstvennyi pegagogicheskyi institut inostrannykh yazikov.

Starikova, I. L. (2008). *Osnovy postroyeniya uchebnykh slovarey soprovoditelnogo tipa: na materiale "Tolkovogo slovarya shkolnika"* [Basics for Compiling Educational Dictionaries of the Accompanying Type: Based on the Material of the "Explanatory Dictionary of a Schoolchild"] [Candidate's of Sciences Dissertation]. Moskovskyi gosudarstvennyi oblasnoy universitet.

Sterkenburg, P. Van (2003). "The" Dictionary: Definition and History. In Piet van Sterkenburg (Ed.) *A Practical Guide to Lexicography* (pp. 3–17). John Benjamins Pub.

SUM – *Slovnyk Ukrayinskoyi Movy v 11 t.* [Dictionary of the Ukrainian Language in 11 vol.]. (1970–1980). Edited by I.K. Bilodid et al. Kyiv: Scientific Thought.

Sweetser, E. (1991). *From etymology to pragmatics: metaphorical and cultural aspects of semantic structure*. Cambridge University Press.

Vayn, O. B. (1990). *Sravnitelno-istoricheskiy aspekt leksikograficheskoy prezentatsii angliyskoy leksiki* [Comparative and Historical Aspect of the Lexicographical Presentation of English Vocabulary] [Candidate's of Sciences Dissertation].

Vinogradov, V. V. (1977). *Izbrannyye trudy. Leksikologiya i leksikografiya* [Selected Works. Lexicology and Lexicography]. Nauka.

Vyvenko, S. O. (2000). *Indoyevropeyskiye etimologicheskiye slovari v gipertekstovoy srede* [Indo-European Etymological Dictionaries in the Hypertext Environment]. Sankt-Peterburgskiy Gosudarstvennyy Universitet.

Weekley, E. (1921). *An Etymological Dictionary of Modern English*. John Murray, Albemarle Street, W.

Wiegand, H. E. (1983). On the Structure and Contents of a General Theory of Lexicography. *Proceedings Papers from the International conference on Lexicography, (Exeter, 9—12 September 1983)*, 13–20.

Yurayong, C., & Sandman, E. (2023). Chinese Word Order in the Comparative Sino-Tibetan and Sociotypological Contexts. *Language, 8*(2). http://doi.org/10.3390/languages8020112

Zgusta, L., & Cerny, V. (1971). *Manual of Lexicography*. Walter de Gruyter.

Zmigrodzki, P. (2020). Narracje metaleksykograficzne a dydaktyka leksykografii u progu trzeciego dziesięciolecia

XXI wieku [Metalexicographic Narratives and Lexicographic Teaching at the Beginning of the Third Decade of the 21st Century]. W A. Piotrowicz, M. Witaszek-Samborska, K. Skibski (Red.) Wydawnictwo Kultura komunikacji językowej 6. *Kultura komunikacji w dydaktyce* (ss. 247–262). Nauka i Innowacje.

List of Illustrative Sources

CEDEL – Klein, E. (Ed.). (1966-1967). *A Comprehensive Etymological Dictionary of the English Language.* Amsterdam; London; New York: ELSEVIER PUBLISHING COMPANY. Vol. 1: A–K. XXV, 853 p.; Vol. 2: L–Z. pp. 855–1776.