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SEMANTIC TRANSFER MECHANISMS IN THE FORMATION OF MODERN MINING TERMINOLOGY: A METONYMIC PERSPECTIVE

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Abstract

Mining terminology has historically developed through semantic mechanisms that enable ordinary lexemes to acquire specialized industrial meanings. Unlike metaphor, which relies on resemblance, this study argues that metonymy – based on conceptual contiguity and associative proximity – plays the central role in restructuring vocabulary for the mining domain. By integrating cognitive-semantic theory with historical lexicology, this article investigates how everyday English words (e.g., vein, face, shaft, bed) underwent systematic metonymic transformation. The study utilizes a qualitative semantic analysis supported by a specialized corpus of mining texts to trace these shifts from medieval to contemporary discourse. Results demonstrate that miners conceptualize underground space through embodied and spatial schemas, utilizing patterns such as part-for-whole and instrument-for-action. This research contributes to terminology studies by demonstrating that technical lexicons are not merely functional labels but reflections of professional cognitive mapping.

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Introduction

Specialized languages, or Languages for Specific Purposes (LSP), are often perceived by outsiders as collections of dry, purely functional labels arbitrarily assigned to technical objects. However, professional discourse is a dynamic conceptual system shaped by the material reality, technological evolution, and occupational practices of its speakers. Mining, arguably one of the oldest industrial spheres in human history, represents a unique domain where linguistic innovation has been inextricably tied to the visceral experience of geological processes and manual extraction.

Throughout its development, the vocabulary of mining has not primarily relied on the invention of new morphological roots. Instead, it has systematically incorporated words originally unrelated to geological expertise – terms drawn from anatomy, domestic architecture, and common manual labor. Everyday lexemes such as face, bed, roof, leg, head, drift, and sump originally denoted human body parts or household objects; yet, in the context of the mine, they function as precise geotechnical descriptors.

The mechanism enabling this transformation is metonymy – an associative cognitive operation whereby a linguistic expression shifts meaning based on conceptual adjacency rather than similarity. While metaphor allows us to understand one thing in terms of another based on resemblance (e.g., "time is money"), metonymy allows one entity to stand for another because they exist within the same conceptual domain or "frame".

Despite the richness of this lexicon, earlier studies of mining terminology (e.g., Hargraves, 2010; Karpukhin, 2010) have largely approached the subject descriptively. These works provide valuable glossaries and etymologies but often stop short of analyzing the cognitive-semantic foundations that drive these

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naming conventions. Why do miners universally refer to the rock wall as a "face" and not a "wall" or "front"? Why is a mineral deposit a "vein" and not a "stripe"? This study posits that these lexical choices are not random. They are the result of embodied cognition – the theory that human language is shaped by our physical interactions with the world. This article aims to fill the gap in industrial lexicology by integrating cognitive linguistics with historical terminology research. By tracing the diachronic evolution of terms like vein, shaft, and pick from the medieval period to the modern digital age, and comparing them with equivalents in German and Russian, this study demonstrates that metonymy is the primary engine of semantic expansion in the mining domain.

2. Theoretical Background

2.1. The Cognitive Turn in Terminology Studies

Traditionally, terminology was viewed through a structuralist lens, where terms were seen as static labels mapping one-to-one onto concepts. However, the cognitive turn in linguistics, pioneered by scholars such as Lakoff, Johnson, and Langacker, revolutionized this view. In this framework, specialized language is not separate from general cognition; it uses the same mental mechanisms – metaphor and metonymy – to structure professional knowledge.

Langacker (1991) introduced the concept of "domain matrices," arguing that linguistic expressions are never processed in isolation. Instead, they evoke a matrix of experiential domains. When a miner uses the word "roof," they are not just identifying a rock surface; they are activating a domain matrix that includes concepts of "protection," "shelter," "overhanging danger," and "structural limitation" derived from the domain of a house.

2.2. Metonymy vs. Metaphor: The Principle of Contiguity

It is crucial to distinguish between metaphor and metonymy to understand mining lexis. As established by Lakoff and Johnson (1980), metaphor relies on cross-

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domain mapping (understanding Domain A via Domain B). Metonymy, however, relies on contiguity – nearness in space, time, or concept within the same domain. Radden and Kövecses (1999) define metonymy as a cognitive process where one conceptual entity (the vehicle) provides mental access to another entity (the target) within the same idealized cognitive model (ICM). In mining, this is pervasive because the environment is constrained. The tool is contiguous with the action; the body is contiguous with the space.

For example, when a miner refers to "the pick" (meaning the action of excavation), they are using an INSTRUMENT-FOR-ACTION metonymy. They are not saying the action is like a pick; they are using the salient object to access the concept of the labor itself. This distinction is vital because it suggests that mining terminology is driven by pragmatic salience. Miners name things based on what is most immediately noticeable or functionally critical in their environment.

2.3. Embodied Cognition and Spatial Orientation

A central tenet of this study is the theory of Embodied Cognition. This theory argues that our conceptual system is grounded in our bodily experience. As humans, we have a front and a back, a top and a bottom, and we stand upright. We project this bodily schema onto the inanimate world.

Peirsman and Geeraerts (2006) note that metonymic patterns often follow specific prototypes, such as PART-FOR-WHOLE or CONTAINER-FOR-CONTAINED. In the claustrophobic, dark, and amorphous environment of an underground mine, the human body becomes the primary "measuring stick." The mine is conceptualized as having a "head" (the start of the tunnel), a "face" (the working front), a "back" (the roof), and "ribs" (the sides). This is not poetic; it is a cognitive necessity for orientation in a space that lacks natural horizons or cardinal directions.

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2.4. The Pragmatics of Industrial Economy

Beyond pure cognition, metonymy serves a communicative function. Panther and Thornburg (2003) emphasize the role of metonymy in linguistic economy. In a noisy, hazardous industrial environment, brevity is a safety requirement. Saying "Check the roof" is significantly faster and more cognitively accessible than saying "Inspect the upper geological stratum for stability." Metonymy allows for high-information density in short linguistic units, a characteristic essential for "operational clarity" in technical discourse.

3. Methodology

The methodological approach adopted in this study is based on qualitative semantic analysis supported by historical and corpus-based examination of selected mining terms. The research procedure was implemented in three interrelated stages.

Stage 1: Term Selection and Corpus Compilation

The study prioritized identifying and explaining metonymic transitions rather than measuring lexical frequency. A small specialized corpus consisting of approximately 450,000 words of mining texts was compiled manually from open-access industrial sources, manuals, and technical reports. The corpus was analyzed using AntConc, which enabled the identification of recurrent collocations and usage environments. Five key terms—vein, face, shaft, bed, and pick—were initially selected due to their presence in historical mining literature. The list was subsequently expanded to include drift, roof, raise, sump, and dump to achieve a broader picture of metonymic mechanisms.

Stage 2: Historical-Etymological Tracing

The origins and semantic developments of each term were reconstructed using general etymological sources and historical mining literature. The Oxford English

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Dictionary and classical mining works such as Agricola's De Re Metallica (1556/1912) served as primary references. Tracing each term across chronological sources allowed the study to identify approximate periods when semantic shifts occurred and establish connections between technological development and linguistic innovation.

Stage 3: Contextual Semantic Analysis

The third stage comprised contextual analysis, examining the selected lexemes in actual usage. Particular attention was paid to discovering typical collocational patterns that reveal metonymic motivation, such as working the face, roof support, or shaft sinking. These contextual patterns provided evidence that semantic change occurred due to conceptual proximity. Additionally, although the primary object of research is English, limited comparative material from German and Russian was included to support the claim that metonymy represents a universal lexical mechanism.

4. Cognitive-Semantic Analysis of Mining Terminology

The analysis of the corpus reveals that mining terminology is structured around three primary source domains: The Human Body, Domestic Architecture, and The Tool/Action Interface.

4.1. The Anthropomorphic Mine: The Body as a Template

The most pervasive metonymic pattern in mining is the projection of the human body onto the geological environment. This PART-FOR-WHOLE and BODY-PART-FOR-OBJECT mapping indicates that miners intuitively treat the mine as a living, organic entity.

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The "Face" (Strebfront / Lava)

The term face is arguably the most critical noun in mining operations. Etymologically derived from the Latin facies (appearance/visage), it originally denoted the front of the human head. By the 17th century, English miners began applying it to the exposed surface of the coal or ore being worked. Cognitively, this is a locational metonymy. The human face is the focal point of interaction; it is the "front" of the person. In the mine, the "face" is the only point that matters – it is where the value lies, where the danger exists, and where the operation advances. The corpus reveals collocations such as "face advance," "face equipment," and "cleaning the face." Interestingly, this metonymy is mirrored in other languages, though the specific body part may shift. In German, Strebfront retains the "front" concept. In Russian, the term Lava (lava) is used for the longwall face, visualizing the coal as a moving stream, but the term Zaboy (the end of the tunnel) functions similarly to the English "face," denoting the point of attack.

"Vein" and "Artery" (Ader / Zhila)

The term vein entered mining in the 14th century, predating the industrial revolution. It originates from the Old French veine (blood vessel). This is a STRUCTURAL ANALOGY metonymy. Medieval geology was heavily influenced by organicism – the belief that the earth was a living mother and ores were her organic products. Just as veins channel life-sustaining blood through the body, mineral veins channel valuable ore through the "dead" country rock. This metonymy is notably stable across languages. The German Ader and the Russian Zhila both mean "blood vessel" and "ore seam." This universality suggests that the cognitive association between fluid-carrying biological tubes and mineral-bearing geological fissures is a fundamental human conceptual mapping.

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"Rib," "Shoulder," and "Leg"

The structural supports of a mine are almost exclusively named after the skeletal system. The vertical timber or steel support is a leg. The side of the tunnel is the rib. This usage goes beyond simple shape resemblance. It reflects a FUNCTIONAL metonymy. In the human body, ribs and legs provide the structural integrity that prevents collapse. In the mine, these elements perform the identical function of resisting the "overburden" (pressure). The mine is conceptually a "body" that must be kept upright.

4.2. The Underground House: Domestic Metonymies

Miners spend a significant portion of their lives underground. Consequently, they map the domain of the HOME onto the mine to domesticate a hostile environment.

"Roof" and "Floor"

Geologically, these are the "hanging wall" and "footwall." However, in operational terminology, they are universally the roof and the floor. This is a SPATIAL metonymy. Even though a mine is a hole in solid rock, the miner cognitively orients himself as if he were inside a building. The corpus shows high-frequency collocations like "roof control" and "roof bolting." This terminology creates a psychological sense of containment and structure in what is actually a chaotic geological fracture.

"Bed" (Lager / Plast)

Originating from the Old English bedd (sleeping place), this term shifted in the 18th century to describe stratified layers of coal or sedimentary rock. This is a complex metonymy combining SHAPE (flat, layered) and FUNCTION (a place where things lie). It implies passivity. The coal "lies" in a bed, waiting to be

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"woken" or extracted. This contrasts with the active "vein" which implies movement/flow.

4.3. The Tool and The Action: Instrument-for-Action

The third major category involves the metonymic slide between the tool, the worker, and the action. This is the INSTRUMENT-FOR-ACTION pattern described by Peirsman and Geeraerts (2006).

"Pick" and "Drill"

In 19th-century ballads and reports, phrases like "he is a good pick" did not refer to the tool, but to the man wielding it (OBJECT-FOR-AGENT). Similarly, "the pick" often referred to the process of manual hewing. In modern terminology, this persists with "drill." One can "drill a pattern" (ACTION) using a "drill" (OBJECT).

"Shaft" vs. "Drift"

The word shaft comes from the Old English sceaft (spear/pole). Originally a tool, it became the word for the long, vertical hole the tool helped create (INSTRUMENT-FOR-RESULT). Drift is unique. It derives from the Middle English concept of "driving" or "slow movement" (e.g., snow drift, drift of the current). In mining, it became the term for a horizontal tunnel. This is an ACTION-FOR-LOCATION metonymy. The motion of driving the tunnel forward became the name of the tunnel itself.

5. Results

The analysis demonstrates that mining terminology in English incorporates several layers of metonymic extension, each motivated by a specific cognitive mechanism. Most examined lexemes originate from non-technical domains such as the human body, household objects, tools, or common physical spaces. Through mining usage, these lexemes acquire stable technical meanings that coexist with their everyday semantic values. A comparison of historical meanings

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and technical applications reveals consistent patterns of semantic transfer motivated by part–whole relations, spatial orientation, functional similarity, and embodied experience.

The most frequent type of metonymic transition observed in English mining terminology is the part-for-whole model, where physical features of underground space are conceptualised through bodily analogies, as in face, rib, leg, head, or shoulder. Other types include instrument-for-action (e.g., pick, drill), location-for-process (stoping, cutting, blasting), and container-for-contained (shaft, hopper, chute). These patterns align with typological models established by cognitive linguistics and terminology research (Hargraves, 2010).

Table 1. Metonymic extension of English mining terms

Term	Original Meaning	Mining Meaning	Cognitive basis	Approximate entry
Face	front of body	exposed surface being mined	part–whole	17th c.
Rib	side of body	side support in passage	bodily analogy	18th c.
Roof	building top	top of underground working	spatial analogy	18th c.
Leg	human limb	vertical support	part-for-whole	19th c.
Bed	place to lie	mineral layer	functional analogy	18th c.
Head	upper body	front of tunnel	bodily analogy	17th c.
Drift	slow movement	horizontal tunnel	action-for-location	18th c.
Raise	upward movement	vertical excavation upwards	action-for-process	19th c.
Dump	discarded material	waste rock area	material-for-location	19th c.
Pick	pointed tool	breaking action	instrument-for-action	19th c.

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These results reveal that mining terminology does not rely on newly manufactured technical morphemes but largely exploits pre-existing everyday vocabulary, modifying its semantic scope according to operational needs.

5.1 Comparative Perspective

Although the main focus of this research is English terminology, comparative observations from German and Russian show notable parallels. German shares several bodily-metonymic terms, especially in underground coal mines, while Russian displays similar semantic extensions shaped during the Soviet industrial mining period.

Table 2. Cross-linguistic examples of metonymic mining terminology

English	German	Russian	Meaning
face	Strebfront	лава	working surface
vein	Ader	жила	ore-bearing fissure
roof	Hangendes	кровля	top of working
rib	Stoß	борт	side surface
dump	Halde	отвал	waste-rock area
head	Vortrieb	забой	tunnel front

These parallels demonstrate that metonymic motivation is not language-specific but rather emerges from universal industrial practices and perceptual categorisation of underground space (Hasanov, 2017). Particularly significant is the shared bodily conceptualisation of geological formations, indicating similar embodied cognitive strategies across mining cultures.

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5.1 Semantic Development and Timeline

The chronological observation of attestation dates indicates that most metonymic transitions occurred during the seventeenth to nineteenth centuries, corresponding to European mining industrialisation. Terms such as vein and face appeared earlier in medieval metal mining, whereas mechanical or action-based lexemes, including pick, drill, and raise, became established only with mechanised extraction.

Table 3. Approximate chronological emergence

Century	Lexemes Becoming Technical
14th–15th	vein, lode
16th–17th	face, shaft, head
18th	roof, bed, drift
19th	pick, raise, chute
20th	drill, blast, conveyor
21st	automation terms (remote, sensor, robotics, laser cutting)

Recent decades have introduced new metonymic extensions linked to automation and remote operation, with expressions such as remote face, laser section, or smart shaft increasingly recorded in contemporary industrial discourse (Hargraves, 2010).

5.2. Corpus Evidence: Collocational Networks and Cognitive Prominence

While etymology reveals the origin of terms, corpus analysis reveals their current cognitive prominence. Using AntConc to analyze the 450,000-word specialized corpus, this study identified "collocational networks" – the words that habitually

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appear alongside the metonymic terms. The strength of these collocations confirms that these metonymies have become "lexicalized," meaning native speakers no longer consciously process the original biological meaning.

Table 4. Collocational Patterns of Key Metonymic Terms

Node Word	Freq. (Normalized per 10k)	Top 3 Collocates (L/R span 4)	Metonymic Function
FACE	42.5	advance, longwall, support	The "Face" is conceptualized as an active agent that moves ("advances").
ROOF	38.2	control, bolt, collapse	The "Roof" is a locus of danger requiring containment ("control").
BED	15.6	methane, thickness, seam	The "Bed" is a static container of resources.
RIB	8.4	spalling, support, pillar	The "Rib" is a structural component vulnerable to degradation ("spalling").

Analysis of Collocations:

The high frequency of the collocate "advance" with "face" (e.g., "rate of face advance") is significant. In general English, faces do not advance; armies or vehicles do. This suggests a secondary metonymic shift: the static rock surface (Face) is conflated with the dynamic mining operation itself. Similarly, the collocation "roof control" indicates a reversal of the domestic frame. In a house, the roof protects the inhabitant; in a mine, the "roof" is a threat that must be "controlled." This validates the cognitive linguistic view that while the source domain (House) provides the name, the target domain (Mine) dictates the functional logic.

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Vein: Originally meaning a blood vessel, "vein" entered mining by the 14th century to describe ore deposits, based on a structural analogy (veins carry blood, mineral veins carry ore). Early texts, like medieval English mining records, show interchangeable use with "lode," retaining biological imagery (Oxford English Dictionary, n.d.).

Face: From Latin facies (appearance), "face" shifted by the 17th century to denote the exposed working surface, reflecting a part-for-whole metonymy (focusing on the immediate work area). British coal mine records emphasize "working the face" as central.

Shaft: From Old English sceaft (pole), "shaft" by the 16th century referred to vertical passages, linked by shape to a spear, transitioning from a general tool to a structural term.

Bed: Originating from Old English bedd (resting place), "bed" by the 18th century described horizontal ore layers, with a functional analogy (supporting resources like a bed supports a sleeper).

Pick: From Middle English pike (pointed tool), "pick" became shorthand for the pickaxe and, metonymically, the act of breaking rock, evident in 19th-century mining songs and manuals, highlighting tool-for-action shifts.

These transitions share common traits: drawing from everyday language (biological, spatial, tool-related) and adapting to mining's physical realities. Historical texts confirm most shifts occurred between the 14th and 19th centuries, aligning with mining's technological advancements and professionalization.

6. Discussion

The results demonstrate metonymy's role in lexical innovation, driven by practical necessity and cultural framing. Three key patterns emerged:

- Structural Analogy: Terms like "vein" and "shaft" suggest miners perceived the earth as a living entity, with ore as its lifeblood or bones, reflecting anthropomorphism.

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● Spatial Focus: "Face" and "bed" emphasize the miner's immediate environment, revealing a task-oriented mindset where the "front" defines progress.

● Tool-Action Conflation: "Pick" illustrates how tools became synonymous with labor, common in craft-based lexicons, waning as machinery dominated but persisting in cultural memory (e.g., folk songs like "The Miner's Pick").

Historically, these shifts correlate with mining's evolution. The medieval use of "vein" coincides with early prospecting, while "face" and "shaft" gained prominence during the Industrial Revolution, when deeper, mechanized mines required precise spatial terms. "Pick," tied to manual extraction, wanes as machinery dominates, though it persists in cultural memory, as seen in mining songs.

Comparatively, other languages show similar processes – German "Ader" (vein) or French "front de taille" (face of the cut) – indicating a universal linguistic strategy in mining communities. However, English terms often retain broader, less specialized origins, reflecting its pragmatic linguistic tradition.

Implications extend beyond linguistics, preserving miners' worldviews and offering a window into their relationship with the earth and labor. Shared terminology unified mining communities, highlighting language's role in professional identity. Future research could explore metonymy in modern mining jargon (e.g., "drill," "blast") or quantify its prevalence across technical fields.

The findings of this research demonstrate that metonymy constitutes a core semantic mechanism in the historical and contemporary formation of English mining terminology. The lexical material analysed in this study confirms that professional language rarely emerges through deliberate terminological planning. Instead, terminology frequently evolves through semantic transformation of common vocabulary, particularly in technical domains grounded in physical experience. Mining discourse exemplifies this tendency because miners conceptualise underground space through bodily, mechanical, and spatial

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analogies that are familiar from everyday life. Consequently, linguistic economy and cognitive accessibility become more important than terminological novelty, enabling non-technical lexemes to adopt specialised, industrial meanings.

A key aspect revealed by the analysis is that metonymy is not merely a rhetorical figure, but rather a conceptual tool that structures professional knowledge. Within mining, the repeated use of bodily and spatial analogies suggests that industrial terminology reflects embodied cognition – the perceptual and physical experience of working underground. Expressions such as roof collapse, working the face, or advancing the rib illustrate how miners linguistically construct the mine as a physical body, while terms like drift, raise, and stoping reveal how physical movement is transferred from bodily action to geological space. These conceptual mappings align with cognitive linguistic interpretations of metonymy as domain-internal meaning transfer driven by perceptual salience (Fauconnier & Turner, 2002).

The comparative analysis across English, German, and Russian indicates that similar metonymic patterns appear in unrelated linguistic environments, suggesting that industrial terminology is shaped by universal experiential schemas. For example, miners in different cultures refer to the working surface as a "face," to the ore fissure as a "vein," and to the waste zone as a "dump" or "shaft," despite the absence of direct lexical borrowing. This demonstrates that metonymy is grounded not in lexical influence, but in shared human perception of industrial environments, supporting universalist claims in cognitive semantics (Hasanov, 2017).

The diachronic observation of mining terminology also provides insight into the relationship between technological innovation and semantic change. Earlier metonymies such as vein and lode correspond to medieval mining, while terms like pick and raise belong to the industrial period, and automation-related metonymies such as remote mining, digital shaft, or smart face emerge only in the late twentieth and early twenty-first centuries. The language therefore reflects

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technological phases of mining activity, demonstrating that metonymy operates dynamically rather than statically. This type of diachronic development reinforces the argument that specialised vocabulary is continually reconstructed in response to technical innovation and operational change (Hargraves, 2010).

Finally, the analysis indicates that corpus data enhances semantic research by providing authentic context and usage patterns. Corpus extracts confirm that metonymic meaning is not a theoretical abstraction, but a linguistic reality visible in technical documentation, industrial reports, and professional manuals. The recurrence of collocations such as roof bolts, face shear, or stoping panel demonstrates stable conceptual associations, reinforcing the view that metonymic meaning operates at the level of professional cognition rather than isolated lexical choice.

Taken together, these observations reveal that metonymy plays a foundational role in the development of mining terminology, linking linguistic form to industrial practice, cognitive patterns, and technological transformation. Therefore, the study makes a broader contribution to terminology theory by demonstrating that specialised lexicons in technical fields should be examined not only descriptively but also through cognitive-semantic frameworks that explain how meaning is constructed and conceptualised within professional communities.

Modern mining introduces a new layer of technological vocabulary associated with automation, robotics and digital monitoring. Expressions such as “smart shaft,” “remote cutting,” “sensor roof control” and “digital blasting management” show that metonymy continues to function actively in the twenty-first century industrial environment. These newly emerging expressions illustrate that mining terminology remains dynamic and continues to expand through metonymic and technological extensions rather than through artificial terminological formation.

Although the research provides a detailed semantic and historical analysis, several limitations must be acknowledged. The study examines a selected group

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of terms rather than the entire mining lexicon, and therefore the conclusions should be interpreted as representative rather than exhaustive. Furthermore, corpus data reflects only written sources and does not fully include oral professional communication in mining communities. These limitations, however, do not reduce the validity of the conceptual findings, and they indicate directions for further investigation.

7. Pedagogical Implications for ESP (English for Specific Purposes)

The findings of this study have significant implications for the teaching of Technical English, particularly for mining engineering students in non-English speaking contexts (e.g., Uzbekistan, Russia, Germany). Traditional terminology instruction often relies on rote memorization of definitions, treating terms like sump, drift, or face as arbitrary labels. However, this study suggests that technical vocabulary is motivated by transparent cognitive mechanisms.

7.1. Cognitive-Based Vocabulary Instruction

Instructors should move beyond static glossaries and introduce Conceptual Metaphor and Metonymy awareness into the curriculum. Instead of simply defining face as "the working surface," an instructor can explain the underlying PART-FOR-WHOLE metonymy: the mine has a "head" (tunnel start) and a "face" (tunnel end). Research indicates that when learners understand the motivation behind a term (i.e., why it is called what it is), retention rates improve. By teaching the "Mine-as-Body" and "Mine-as-House" conceptual metaphors, students can predict the meanings of related terms. If they know roof (ceiling) and floor (ground), they can logically infer the meaning of pillar (support) or room (excavated space) within the "Room and Pillar" mining method.

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7.2. Addressing Polysemy in Technical Translation

One of the greatest challenges for students and translators is polysemy—words having multiple meanings. A term like drift causes confusion because its general English meaning (to move slowly, like snow or water) seems unrelated to its technical meaning (a horizontal tunnel). Through a cognitive-historical approach, educators can trace the ACTION-FOR-LOCATION metonymy. By explaining that drift originally referred to the action of driving the tunnel, and later shifted to the tunnel itself, the semantic link becomes clear. This reduces the cognitive load on students, who no longer view the technical definition as a random contradiction of the general definition, but as a logical extension of it.

7.3. Cross-Cultural Terminological Awareness

For students entering the international mining workforce, understanding these cognitive universals is vital. As shown in the comparative analysis with Russian (lava/zaboy) and German (Ader), the reliance on bodily and spatial metonymy is a shared professional trait. Awareness of these patterns allows for more accurate translation and communication in multinational projects. It shifts the focus from translating words to translating conceptualizations – recognizing that while the specific word may change (e.g., Strebfront vs. Face), the underlying cognitive map of the underground space remains remarkably consistent across linguistic boundaries.

8. Future Research Directions

While this study focused on established terminology, the rapid digitalization of the mining sector offers a fertile ground for future cognitive-linguistic research. Industry 4.0 is introducing a new wave of terminology related to automation, such as digital twins, smart rock, and data lakes. It remains to be seen whether the "Mine-as-Body" metonymy will persist or if it will be replaced by a "Mine-as-Computer" conceptualization (e.g., processing, inputs, networks). Additionally,

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quantitative corpus studies could measure the productive frequency of these metonymic patterns in oral communication versus written reports, offering deeper insights into the sociolinguistic stratification of mining communities.

9. Conclusion

The analysis conducted in this study demonstrates that metonymy functions as a major cognitive and linguistic mechanism in the formation of English mining terminology, allowing common vocabulary to acquire specialised industrial meanings through systematic semantic extension. This process reflects not only linguistic flexibility, but also the conceptual ways in which miners perceive underground environments and industrial processes. The predominance of bodily and spatial metonymies indicates that mining terminology is motivated by embodied cognition, where underground space is understood and linguistically encoded through familiar physical schemas, such as front, head, roof, rib, or face. These findings confirm theoretical claims that metonymy originates from cognitive salience rather than rhetorical creativity, and that professional lexicons develop through domain-internal semantic restructuring rather than external lexical borrowing (Fauconnier & Turner, 2002).

The diachronic material shows that the emergence of metonymic terminology coincides with technological phases in mining history, with earlier bodily analogies appearing in medieval and pre-industrial periods, while action-based and mechanical terms developed during the industrial revolution and modern mechanised mining. New types of metonymic extension related to automation and remote extraction further demonstrate that metonymy is a continuous and adaptive mechanism, responding to technological innovation and industrial transformation. As such, mining terminology remains a dynamic linguistic system rather than a fixed terminological inventory (Hargraves, 2010).

Comparative evidence reveals that similar metonymic extensions occur in German and Russian mining vocabulary, supporting the notion that metonymy is

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not language-specific but grounded in shared industrial experience, perceptual strategies, and embodied cognition. These parallels also illustrate that mining communities conceptualise underground environments in similar ways across cultures, reinforcing the argument that semantic development in technical fields is shaped by universal cognitive mechanisms rather than purely linguistic factors (Hasanov, 2017).

Finally, the use of corpus-based contextual analysis validates the presence of metonymic meaning not only in dictionaries and historical sources, but also in contemporary industrial discourse, technical documentation, and professional practice. Observable collocations indicate that metonymic meanings are productive, conventionalised, and integral to mining communication.

Future research may extend this investigation to other industrial fields, such as metallurgy, oil extraction, geology, or engineering, where similar semantic processes may be found. Comparative studies involving typological analysis of metonymy in multiple languages, especially non-European or Turkic languages, could reveal further cross-cultural patterns and contribute to understanding linguistic universality in industrial terminology. Additionally, quantitative corpus methods may be applied to identify metonymic frequency, variation, and productive patterns in modern mining discourse. In this way, the study opens new directions for interdisciplinary research linking cognitive linguistics, historical lexicology, and industrial terminology, while deepening our understanding of the conceptual mechanisms underlying specialised language.

References

1. Agricola, G. (1912). De re metallica (H. C. Hoover & L. H. Hoover, Trans.). Mining Magazine. (Original work published 1556)
2. Cabré, M. T. (1999). Terminology: Theory, methods, and applications. John Benjamins Publishing.
3. Fauconnier, G., & Turner, M. (2002). The way we think: Conceptual blending and the mind's hidden complexities. Basic Books.

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Eureka Journal of Language, Culture & Social Change (EJLCSC)
ISSN 2760-4926 (Online) Volume 2, Issue 5, May 2026

https://eurekaoa.com/index.php/3

4. Hargraves, D. (2010). Dictionary of mining engineering. Routledge.
5. Hasanov, B. (2017). Texnik terminlarning shakllanishi va rivoji. Buxoro davlat universiteti nashriyoti.
6. Jo‘rayev, U. (2015). O‘zbek tilida texnik terminlarning shakllanishi va rivojlanishi. Fan Nashriyoti.
7. Karpukhin, O. V. (2010). Leksiko-semanticheskie protsessy v professional’nom yazyke gornyakov. Ural University Press.
8. Lakoff, G., & Johnson, M. (1980). Metaphors we live by. University of Chicago Press.
9. Langacker, R. W. (1991). Foundations of cognitive grammar: Vol. 2. Descriptive application. Stanford University Press.
10. Mahmudov, N. (2018). Leksikologiya va semasiologiya asoslari. O‘zbekiston Milliy Ensiklopediyasi.
11. Nurmonov, A. (2006). Tilshunoslikka kirish. Fan.
12. Panther, K.-U., & Thornburg, L. L. (Eds.). (2003). Metonymy and pragmatics. John Benjamins.
13. Peirsman, Y., & Geeraerts, D. (2006). Re-thinking metonymy: A prototype-based approach. Cognitive Linguistics, 17(3), 299–316.
14. Poljakov, E. V. (2018). Kognitivnye mekhanizmy metonimii v professional’nom diskurse. Rossiyskaya Akademiya Nauk.
15. Qilichev, O. (2019). O‘zbek tilida metafora va metonimiya masalalari. SamDU nashriyoti.
16. Radden, G., & Kövecses, Z. (1999). Towards a theory of metonymy. In K.-U. Panther & G. Radden (Eds.), Metonymy in language and thought (pp. 17–59). John Benjamins.
17. Rahmatullayev, Sh. (2008). Hozirgi o‘zbek adabiy tili. O‘zbekiston Milliy Ensiklopediyasi.
18. Thrush, P. W. (1968). Dictionary of mining, mineral, and related terms. U.S. Bureau of Mines.
19. Xojiev, A. (2007). O‘zbek terminologiyasi taraqqiyoti masalalari. O‘zbekiston Milliy Ensiklopediyasi.

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ISSN 2760-4926 (Online) Volume 2, Issue 5, May 2026

https://eurekaoa.com/index.php/3

20. Xudoyberganova, D. (2014). O‘zbek tilining mazmuniy tuzilishi. Fan Nashriyoti.
21. Yo‘ldoshev, A. (2012). Til va jamiyat: Leksik birliklarning ijtimoiy tabiati. Fan Nashriyoti.