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Michèle Fruyt

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Temperature and Cognition in Latin

Michèle FRUYT
University of Paris-Sorbonne (Paris IV)
michele.fruyt@gmail.com

The subject of temperature is a particularly interesting linguistic area within the Latin lexicon since it provides us with valuable information on the relationship between the structure of the lexicon and its underlying cognitive criteria. The concept of temperature has been lexicalized and encoded into Latin morphology and lexicon in such a way that its study provides us with important clues to the role of cognition in linguistic creation in this particular domain. The linguistic data at our disposal shows what the most important features were that speakers associated with temperature and its effects.

In the first instance, we will show that the terms for temperature are included in some of those lexical sets that display certain specific cognitive features, and especially in the *-or* nouns (section 1). This demonstrates the position assigned to temperature within the natural world by the linguistic community.

Our study will also deal with the semantic-referential differences between the various thermic lexemes. These are mainly built on the Latin radicals, *cal-* for warmth, *frīg-* for cold, *tep-* for the intermediate lukewarm situation (sections 2 and 5), which constitute the three most frequent lexical morphemes used to indicate different levels of temperature. The high frequency of *cal-* and *frīg-* in the texts shows that they belonged to the fundamental vocabulary of Latin.

We will also attempt to shed light on the factors underlying the use of these radicals. Temperature lexemes may refer to an objective thermic scale, but also to subjective scales (sections 3 and 4) and they may convey an axiological value (section 7). These semantic phenomena depend on the perception of the human body by the speaker. In this domain, as in other cognitive domains, the human body is the fundamental point of reference and the “yardstick”. Each utilisation of a lexical item relating to temperature is subject to the speaker’s own individual appreciation, which is itself dependent on his external environment (climate, etc.) and on his personal situation (health, body temperature, etc.). We will also mention the role played by certain concrete, everyday entities (such as fire and ice) that are used by the linguistic community as reference points, since they concern the basic experience-based knowledge of every person belonging to that society (section 8). They show the degree to which conventional, prototypical entities are related to the various degrees of temperature.

Contrast, differentiation and cognitive metaphor (section 6) are also well documented in the temperature domain.

1. THE *-OR* FORMATION FOR THERMIC NOUNS

The importance and specific nature of nouns denoting temperature as perceived by the Latin linguistic community is clearly shown by the fact that Latin thermic nouns belong to a specific set of nouns displaying the *-or* M. suffix¹. This is characteristic, at the level of the *significant*², of natural and physical processes that cannot be controlled by man. Since the temperature nouns in *-or* belong to this more general lexical formation, we may infer that the specific cognitive features of the whole formation also apply to temperature nouns.

1.1. Extralinguistic features

The most remarkable feature of the *-or* nouns is that the occurrence of the suffix is linked to a cognitive class of entities and processes with the following extralinguistic features³.

a) These entities and processes belong to the physical world of nature and they are classified into natural categories.

b) They are perceived by at least one of the five senses (sight, hearing, touch, taste, smell).

c) They occur in a locus which may be an inanimate entity or a human being.

d) This locus does not control the process, but, on the contrary, is subordinated to it (with a few exceptions). More precisely, the natural process denoted is not under the control of man. The human being who is the process locus is not involved as a rational person (with reason, intelligence, speech, autonomy of movement), but as a mere physical body or as the locus of a psychological state, with consequences at the physiological level. He or she is in a panic or a furious, irrational state or is unable to speak or is paralysed and unable to move or realise any kind of action.

e) The process does not involve two participants (two semantic roles, e.g. an agent and a patient), but only one, which is the locus where the process takes place.

1 The suffix *-or* in the nominative sg. with a short *o*, and a long *o* in the other cases: genitive sg. *-ōr-is*.

2 We use this word as a phonographical transfer of Fr. *signifiant* in F. de SAUSSURE's terminology. It denotes the phonological sequence of a given lexical item and more generally all its formal properties, as opposed to its semantic and semantic-referential properties (cf. Fr. *signifié* in F. de SAUSSURE's terminology).

3 Some of these extralinguistic features were established by QUELLET (1969: 185-190), using another terminology.

A counter example for these cognitive criteria for *-or* is the suffix *-tūra* (*-ae* F.). Obeying another type of cognitive selection, the *-tūra* nouns do not denote natural processes, but concrete entities made by man (artefacts).

These specific extralinguistic and cognitive features of the *-or* noun set were developed in Latin itself, since the other Indo-European languages that display this inherited suffix do not share them⁴. Moreover, these *-or* nouns belong to the Latin fundamental vocabulary in prose as well as poetry (*calor* "warmth", *dolor* "pain", etc.) and they must have been usual in the everyday spoken Latin language, since they have passed into the Romance languages.

It is remarkable that these nouns are all masculine in Latin, while their cognates in other I.-E. languages are mainly neuter. Moreover, their descendants are feminine in French (Fr. *chaleur*, *douleur*), which could be due to the attraction of feminine abstract nouns in this particular language (Fr. *la croissance*, *la pauvreté*, *la longitude*, etc.).

1.2. The most frequent *-or* thermic nouns

The most frequent and, therefore, the most important basic temperature nouns suffixed with *-or* are: *calor* "warmth, heat", *feruor* "extreme heat" (etymologically, the heat from boiling water), *ardor* "extreme heat" (etymologically, the heat of fire), *frīgus* "cold, coldness" (the only noun that is neuter in this lexical set⁵), *algor* "extreme cold".

Moreover, some entities and processes denoted by other *-or* nouns are also associated with temperature, although they also have other referential domains: *candor* "brightness, pure white colour" may refer to heat from the glow of a fire or molten metal; *sudor* "sweat" denotes a consequence of fever or effort and may be used for body heat; *rigor* "stiffness", *languor* "inactivity, illness", *torpor* "torpor, paralysis, loss of physical power" denote the negative consequences of coldness for mankind; *pallor* "paleness of complexion, pallor" is a chromatic term referring to a consequence of the coldness of death; *horror* "the action of standing stiffly" refers to a bodily rigidity arising from cold.

4 The Latin nouns suffixed with *-ōr* (gen. *-ōr-is*) M. display an inherited Indo-European sigmatic suffix **-es- /-os-*, which is mainly used in the neuter gender, for example in Latin, Sanskrit, Greek: Lat. *gēn-ūs* (gen. *gēn-ēr-is*) Nt., Sk. *JAN-as-* Nt. (Sk. *JAN-* "be born"; *jana-loka-* M. "the world of human beings"); Gr. γέν-ος "birth".

5 See below for an interpretation of this neuter gender. *Frīgus* M. "shivering from fever" was created in Late Latin as an analogy within the medical vocabulary (cf. *dolor*, etc.).

These last words above referring to coldness often co-occur in the texts with the adjective *frīgidus* "cold", which displays the highest frequency among the words denoting cold: e.g., *horror* is associated with the adjective *frīgidus* "cold" in Lucretius 6,1011: *frigidus horror*. In the following passage (Quintus Curtius 3,5,3) describing Alexander the Great's sudden death, the stiffening of his limbs is expressed by the noun *horror* as well as the verb *rigēre* "be rigid from cold" (which is parallel to the *-or* noun *rigor*). Death is also implied through Alexander's sudden pale complexion (*pallor*), whereas warmth (*calor*) is connected with life (*uītālis*)⁶:

Quintus Curtius 3,5,3 : (Alexander) *descendit in flumen. Vixque ingressi subito **horrore** artus **rigere** coeperunt, **pallor** deinde suffusus est et totum propemodum corpus **uitalis calor** liquit.*

"(Alexander) went down into the river. But hardly had he entered it when his limbs began to stiffen with a sudden chill, then he lost his colour, and the vital warmth left almost his entire body" (translation by J. C. Rolfe, 1971, Loeb Classical Library).

We would also like to stress the fundamental role played by human perception in this area. The *-or* nouns, as we have seen, refer to physical natural states and are linked to all kinds of perceptions involving the senses: hearing for sound and noise⁷, vision⁸ for brightness, smell⁹, taste¹⁰, and touch. Since the temperature processes represent a sub-class within these natural categories, they also share the same properties. This perception of temperature always derives from the human body, which stays the reference point for every appreciation or judgment on temperature. It may also be applied to external, atmospheric temperature, as felt by the human body or by a body part (tactile feeling for example). The same Latin words meaning "cold" and "warm" may apply to both external and internal temperature and this property has been preserved in the Romance languages, where the two phenomena are differentiated by the use of

6 For more information on the link between cold and death on the one hand and warmth and life on the other, see below § 7.1. and 7.2.

7 Cf. *clāmor* "shout, cry of protest", *fremor* "low and confused noise, roar", *rumor* "confused noise made by many voices", *strīdor* "high-pitched sound" (contact of hard surfaces, air, etc.) (cf. *uāgor*, *clangor*, *fragor*, *plangor*, *sonor*, *crepor*, etc.).

8 Brightness: *candor*, *fulgor*, *nitor*, *splendor*; colour: *color*, *liuor* (sickly yellow, pale), *nigror* (black, dark), *rubor* (red), *candor* (pure white), *luror* (sickly yellow), etc.

9 Cf. *odor* "smell" (generic term), *nidor* "rich strong smell, fumes", *putor* "rotteness with foul smells", *foetor* "foul smell", etc.

10 Cf. *sapor* "flavour, taste", *amāror* "bitter taste", *acor* "bitter flavour", etc.

two different light verbs¹¹ with personal vs. impersonal uses, e.g.: Fr. *il fait froid* “the weather is cold” (for weather temperature only), “it is cold” (for external cold in general) and *j’ai froid* “I am cold” for internal cold felt by a given person¹².

1.3. Main axiological values of the *-or* thermic nouns

Within this *-or* set of nouns, one important group of lexemes denotes undesirable, obnoxious states: they have acquired an axiological connotation. When applied to inanimate entities, the *-or* nouns are often used for the deterioration of matter; when applied to men, they often refer to pathological states¹³.

The Latin temperature *-or* nouns are used when cold and heat are undesirable states-of-affairs, both for external and internal heat, e.g., *algor* “extreme cold” may be used for the cold feeling felt by a person under conditions of extreme fear. In Plautus, the speaker uses three *-or* nouns in a row in order to describe the desperate situation in which she finds herself. They all denote undesirable processes that took possession of her and left her helpless and powerless:

Pl. *Rud.*215: *algor, error, pauor me omnia tenent.*

“coldness, derangement of the mind and terror, they all have hold of me”.

But a few *-or* nouns denote “good” or “neutral” states¹⁴. Warmth in the Latin texts is mostly a desirable situation, while cold is usually undesirable. But it all depends on the extralinguistic circumstances: on a very hot summer day, cold (*refrigerare* “cool, refrigerate”) is a good thing. The extreme heat of the sun, when it burns the ground, is harmful and considered a bad thing¹⁵.

11 We use the term *light verb* here as a synonym of *function verb*, *weak verb*, Fr. *verbe-support*; cf. FRUYT (2011: 785) about Lat. *facere*. Subsequently, we call a *complexeme* the whole expression containing a light verb, as an equivalent to B. Pottier’s Fr. *lexie complexe* (POTTIER 1997 :7) for a lexicalized sequence of several words functioning as one and the same semantic and syntactic unit. See below note 85 and FRUYT (2011: 663, note 11) for the creation of this term in English.

12 For more details, see below § 9.

13 Therefore the denotation of “bad” states is a development that happened in Latin itself and that was not inherited with the suffix. It is a Latin specialisation of the suffix and it was the consequence of the creation of a new Latin lexical set of lexemes linked by common extralinguistic features and cognitive criteria.

14 E.g., *honōs/ honor* « honour »; *candor* « brightness, heat glow, whiteness, moral purity”; *color* “colour”.

15 For more details about the perception of cold and warmth, see below § 7.

1.4. Extralinguistic areas

The temperature nouns may also appear in other semantic-referential classes within the whole *-or* formation, e.g. in meteorological vocabulary: *calor*, *feruor*, *frīgus*, *algor* belong here to the same sub-set as *fulgor* "brightness, flame, flash of lightning", *ūmor* "liquid, water" ("rain": Verg. *Buc. (Ecl.)* 3,82), *pluor* "rain" (Laber. *Com.* 59).

The thermic *-or* nouns may also belong to the medical vocabulary when denoting an internal body feeling: a fever or an illness.

A specific feature of the temperature nouns in *-or* is that temperature is not just a process which is beyond the control of man. Man may actually be controlling the external temperature when it is not weather related, e.g., in cooking. Cooks normally control the temperature of what they are cooking and the recipes¹⁶ mention the temperature to which a given liquid has to be brought.

2. THE THREE MAIN LATIN SYNCHRONIC RADICALS AND THEIR LEXICAL SETS

Due to the need for precise denotations of temperature degrees in everyday life, the Latin temperature vocabulary is very precise and is not limited to the *-or* nouns.

On each of the three main synchronic Latin radicals *cal-* "heat", *frīg-* "cold", *tep-* "lukewarm" there has been built a lexical set organized as a micro-system with a complementary distribution between the various items. The common denominator in a given set is the synchronic radical, functioning as a lexical morpheme: *cal-*, *tep-*, *frīg-*. We list below the various lexemes included in these three sets.

2.1. The morpheme *cal-* for warmth

Within the genetic set based on the Latin synchronic radical *cal-* "warm, with a high degree of temperature", Latin provides the following lexical items:

1°) the adjective ***cal-idus*** "warm" (which has the highest frequency among the lexemes in this set) with an *-idus* suffix. Derived from this adjective there is documented an adverb ***calid-ē*** "in hot haste"

16 About cabbage: Cato *Agr.*157,1: *commoetatque sese semper cum calore* "it is always changed with heat".

(Pl. *Ep.* 284) and two nouns: **calidum**, *-ī* Nt. “heat, a warm drink” and **cald-or** “heat, warmth”¹⁷, showing the productivity of *-or* in the agricultural vocabulary:

Varro *R.* 1,55,6 : *olea lecta si nimium diu fuit in aceruis, caldore fracescit et oleum foetidum fit.*

“If the olives, after being picked, lie too long in the piles, they spoil **from the heat** and the oil becomes rancid” (translation W.D.Hooper and H.B.Ash, Loeb Classical Library, 1934).

2°) the noun: **cal-or** “warmth”.

3°) a state verb: **cal-ē-re** “be warm”. From the *infectum* stem of this state verb is derived an inchoative or progressive verb: **calē-scere** « become warm ».

4°) a causative progressive verb: **cale-faciō** (+ acc.) “to warm (something)”. Its past passive participle: **cale-factus** “warm-ed” has a high frequency and denotes the state resulting from the completion of the previous process of warming. Thus, the meaning of this participle is different from that of the adjective *calidus* “warm”, which denotes a state perceived as a quality. This participle is related to the passive form: **cale-fiō** “to be warmed, to become warm”.

2.2. The morpheme *tep-* “lukewarm”

The same schema could be used for the radical *tep-* “lukewarm, moderate degree of temperature”. The following lexical items are built on the morpheme *tep-*:

1°) the adjective **tēp-idus** “lukewarm, mild, warm”, from which are derived the adverb **tepid-ē** “in a warm condition” and the verb **tepid-ā-re** “to maintain a lukewarm temperature”, “keep warm”:

Plin. *Hist. Nat.* 17,250: *ne frigus uites adurat, circumfundunt riguis, quod ibi tepidare uocant.*

“in order to impede **the cold** from burning the vines, they irrigate them, which they call **tepidare** “maintain in a lukewarm temperature””.

2°) the noun **tēp-or** M. “mild heat”.

¹⁷ Varro (*L.* 5,59: *caldor e caelo.*) writes that the word *caldor* “warmth” comes from the word *caelum* “sky”. Although this explanation is different from our modern etymologies, it is interesting in a cognitive perspective, since it shows the synchronic link made by a speaker between the atmospheric warmth and the sky or the sun, considered as the main source of heat.

3°) the stative verb **tēp-ē-re** "to have a moderate degree of heat" (Cato), from which is derived the inchoative and transformative verb **tepē-sc-ē-re** "become lukewarm", i.e., "become warm" (Cic. *De nat. deor.*; Ov.; Verg. *En.*) or "become colder, become less warm" (Mart.).

4°) the causative progressive verb **tēpē-faciō** "make lukewarm, make warmer" (Cic. *De nat. deor.* 2,40; Plin. *Hist. Nat.* 15,19); its passive is **tepe-fieri** (Cels.) "become lukewarm, become warmer", p.p.p. **tepe-factus** "slightly warmed" (Cic. *De nat. deor.* 2,26). On **tēpē-faciō** is built a frequentative-intensive verb in **-ta-re**: **tēpē-fac-tā-re** "make warmer":

Catul. 68, 29: **Frigidā** deserto **tēpēfactat** membrā cūbīlī.
 "he warms his cold body parts in a deserted bed".

2.3. The morpheme **frīg-** "cold"

The following terms are built on the radical **frīg-**:

1°) the noun **frīg-ūs, -ōr-is** nt "cold", which has a diminutive **frīgus-culum, -ī** nt "a small degree of coldness" (Tert. *Anim.* 25,7). On **frīgus** are built: a compound causative adjective **frīgōri-ficus, -a, -um** "producing coldness" (Gell. 17,8,14), a denominative verb: **frīgēr-ā-re** tr. "to make cool" (Catul. 61,30), the same denominative verb with a preverb: **re-frīger-a-re** tr. "cool, make cooler".

2°) the noun **frīg-or, -ōr-is** M. "cold, shivering" (Aug. *Serm.* 40,1 Mai)¹⁸.

3°) the adjective **frīg-idus, -a, um** "cold". Its diminutive **frīgīd-ulus** "cold" displays a connotation of pity for Ariadne, abandoned by Theseus (Catul. 64,131). The adjective produces the nouns **frīgīda, -ae** F "cold water" (*aqua* F.) (Sen.) and **frīgīdum, -ī** nt "cold temperature" (Sen. *Quaest. Nat.* 6,13,2) as well as the adverb **frīgīdē** "without enthusiasm, coldly" (with verbs of speaking), "without force or effect", and the denominative verb **frīgīd-ā-re** tr. "make cold" or "give the impression of being cold" in the medical vocabulary (Cael.-Aur.). The adjective **frīgīdus** is also used as a derivation base with the technical suffix **-arius** in the technical adjective **frīgīd-ārius, -a, -um** "of or for cold water":

18 For this analogical creation in Late Latin, see below § 7.2.

Vitr. 5,10,1: *aenea ... tria ...unum caldarium, alterum tepidarium, tertium **frigidarium**.*

„three vessels made of bronze containing warm, lukewarm and **cold** water”.

which itself provides a noun in the same domain for the Roman baths: **frigid-ārium, -ī** Nt. “a cooling-room in a bath” in Vitruvius.

4°) the state verb **frīg-ē-re** “be cold, be paralysed with inactivity, fail to win the favour of someone, have a cool reception”. On this state verb is built a progressive and transformative verb **frīgē-sc-e-re** “lose heat, become cold” (Cato Agr. 95,2; Lucr. 6,865); (of a feeling) “to cool off”.

5°) the causative progressive verb **frīgē-faciō** tr. “make cold” (Prisc.¹⁹), on which a frequentative-intensive verb was built with the suffix **-tā-re**: **frīgē-fac-tā-re** tr. “make cold”:

Pl. Rud. 1326: *os **calet** tibi; nunc id **frigefactas**.*

“your mouth **is too hot**; now you are **trying to cool** it **down** (by using this pun)”.

Pl. Poen. 759-760:

LY.: - **Calidum** prandisti prandium hodie? Dic mihi.

AG.: - *Quid iam?* LY.: - *Quia os nunc **frigefactas**, quom rogas.*

LY.: “Did you eat your lunch **too hot** today? Tell me.”

AG.: “- Why?” LY.: - “Because you **are trying to cool** your mouth **off** (by a cold pun)”²⁰.

6°) the noun: **frīg-ē-dō, -din-is** F. “cold” (Varro Men. 77).

3. TEMPERATURE AS A SCALAR NOTION

Temperature, by definition, is a gradable notion showing scalarity, since it occurs in various degrees along a *continuum* running between two extremities, extreme heat and extreme cold. Thus, the various thermic adjectives, adverbs, verbs and nouns may be submitted to intensification and desintensification. This quantification may use grammatical or lexical morphemes.

19 This verb must have been in use earlier than its mention by Priscian, who is a Late Latin grammarian, since its derivative is already documented in the Archaic Period.

20 Translation by A. Ernout, Paris, Belles Lettres, 1961 : AG. : “- Pourquoi cela?” LY : -“Tu veux te refroidir la bouche par une froide plaisanterie”.

3.1. Intensification through grammatical means

The scalarity of thermic concepts permits the regular occurrence of comparatives and superlatives for the adjectives and adverbs concerned²¹. A larger quantity, as is to be expected, may be expressed by a comparative and a superlative. On the adjective *frigidus* "cold" are built the comparative form *frigid-ior* "colder" and the superlative *frigid-issimus* "very cold, extremely cold". In a parallel derivation, the comparative *frigidius* and the superlative *frigidissime* are built on the adverb *frigide* "in a cold way or situation". Built on the adjective *calidus* "warm" we find *calid-ior* "warmer", *calid-issimus* "very warm"; on the adverb *calide* we find *calid-ius*, *calid-issime*. The adjective *tepidus* "lukewarm" is documented in the comparative form *tepid-ior* and in the superlative *tepidissimus*²².

3.2. Intensification expressed by lexical morphemes

Intensification for the denotation of notions of temperature may be achieved by several complementary lexical morphemes denoting various degrees of intensity within the same temperature zone. They are based on the denominations of natural entities that are well-known to the linguistic community as prototypically displaying high degrees on the cold or the warm argumentative scale.

We can quote here, in increasing order of intensity, for cold: *frīg-* "cold" (the general meaning), *gel-* "very cold, icy cold" (*gelu* "frost", *gelidus*); for warmth: *cal-* "warm" (*cal-or*, *cal-idus*, *cal-e-re*: the general meaning), *feru-* "very hot, boiling hot" (*feru-or*, *feru-e-re*), *ard-or* "very hot, as hot as fire" (*ard-e-re*).

3.3. (Dis-)intensification using prefixes and suffixes

3.3.1. Intensification

The prefix *per-* is a productive quantifier for larger quantity modifying adjectives, adverbs and verbs. It may also be used for temperature:

a) for intense heat: *per-feruere* "be boiling hot" (stative formation), *per-ferue-fīo* "become very hot"²³; *per-cande-facio* "impart a glowing heat throughout"²⁴; *per-calesco* "grow very hot"

21 Cf. *frigidus*, *frigid-ior*, *frigid-issimus*; *gelidus* "iced, as cold as ice, freezing", *gelid-ior*, *gelid-issimus*; *calidus*, *calid-ior*, *calidissimus*; *tepidus*, *tepid-ior* (Varro R. 1,6,2), *tepid-issimus* (Plin. Ep. 5,6, 24).

22 The adverb *tepid-ē* is less frequent; it is documented in the superlative form *tepidissime* in Aug. Conf. 8,11,27.

23 Varro R. 1,9,2: (terra) sole **perferue** ita **fit** ut radices satorum comburat.

24 About fire (Lat. *ignis*): Vitruvius 8,3,1: *ardore percandefacit terram*.

Lucr.; *per-cale-facio* “make very hot”²⁵;

b) for an intense cold: *per-frīgidus* “very cold”²⁶; *per-frīge-facio* “to make very cold”²⁷; *per-frīgesco* “become very cold”²⁸.

In the same intensive function, from the 1st century A.D. on, the prefix *prae-* has a high frequency, mainly in the technical texts:

a) warmth: *prae-feruidus* “exceedingly hot, burning” (agriculture)²⁹, *prae-cal-factus* “heated beforehand” (Larg.: medicine and veterinary art); *prae-calidus* “exceptionally hot”³⁰;

b) cold: *prae-frīgidus* “very cold”³¹.

3.3.2. *Dis-intensification*

Smaller quantity is denoted by the prefix *sub-* used for dis-intensification: *suf-ferue-facio* (and passive °-*fio*) “bring almost to boiling-point or keep at that temperature”³²; *sub-frīgidē* adv. “without much life, pedantically” Gell.

The diminutive suffix *-culus*, *-ulus*, which provides the semantic feature “small quantity” may be applied to a given degree of temperature: *frīgus-culum* “a small degree of coldness” (Tert.*Anim.* 25,7).

But this same diminutive suffix may also display a connotative use, showing the feelings of the speaker: e.g., in the adjective *frīgidulus* “cold” with a connotation of pity for Ariadne, abandoned by Theseus (Catul. 64,131).

25 Varro *R.* 1,27,2: *glæbis ab sole percalefactis*

26 Cic. *Verr.* 4,86 : *erat hiems summa, tempestas perfrigida.*

27 Pl. *Ps.* 1215 : *mihi ...ille Surus cor perfrigefacit.*

28 Varro *R.*; about water (Lat. *aqua*): Plin. *Hist.Nat.* 31,66 : *difficilius perfrigescent marina calefacta.*

29 Col. 3,1,3 : *omni declinatione mundi, nisi tamen glaciali uel praeferuida.*

30 Tac. *Ann.* 13,16: *praecalida...potio traditur Britannico* “an extremely hot drink is given to Britannicus”.

31 About a wind: Ov. *Pont.*: *prae-frigidus Auster.* In space, the cold is associated with shadow (an absence of sun) and orientation towards the North: Plin. *Hist. Nat.* 17,147: *quamlibet opaco septentrionalique et prae-frigido situ.*

32 Mainly in technical texts: Plin. *Hist. Nat.* 12,129: *odor...in uino subferuefacti (malabathri) antecedit alios;* 14,85; etc.

4. ARGUMENTATIVE SCALES

4.1. Denotative vs. argumentative scales

The temperature morphemes may be classified according to two argumentative scales³³. The first scale is graduated towards the highest degree of temperature (*cal-* warmth or heat) while a symmetrical scale is orientated towards the lowest degree of temperature (*frīg-* cold, coldness).

Thus, the verb *frīgē-sc-e-re* "become colder, start becoming cold" (Cato *Agr.* 95,2; Lucr. 6,865) is orientated upwards towards a higher degree on the argumentative scale of coldness, while the verb *cal-e-sc-e-re* is orientated upwards towards a higher degree of warmth on the opposing argumentative scale of warmth.

Following the theory set out by O. Ducrot³⁴, we must make the distinction here between the denotative and the argumentative perspective. The best theoretical framework in which to describe this type of occurrence is O. Ducrot's notion of Fr. *réalisant* vs. *dé-réalisant* that we find in his theory of argumentative scales (Fr. *les échelles argumentatives*). As he shows, the kind of scalar notion involved in temperature is mainly used in an argumentative way, i.e., orientated by the speaker either towards the greater or towards the lesser. The same degree of temperature may be perceived as a "good" or as a "bad" thing. It all depends on the circumstances and on the extralinguistic situation in which the speech situation takes place or to which the speaker is referring. The choice between these two axiological values is based on the notion of limit: warmth and coldness are "good" things if they stay within certain limits and "bad" things if they extend beyond these limits. Warmth is a good thing in cold weather, but a bad thing in hot weather. These lower and higher limits are what O. Ducrot calls *thresholds*, Fr. *seuil*. Going beyond these limits involves an inversion of the axiological value: warmth, which is generally a good thing for the speech community, becomes a bad thing if it increases beyond a certain degree and becomes excessive. These limits are empirical ones. They are related to the temperature perceived by man and, therefore, to the temperature of the human body.

³³ We use *argumentative scale* here following O. DUCROT's terminology, as a translation for Fr. *échelles argumentatives* (DUCROT 1980).

³⁴ See DUCROT 1980.

4.2. Argumentative functioning of *tep-* “lukewarm”

4.2.1. *The basic meaning: “moderate”*

The functioning of the radical *tep-* is more complex than that of *cal-* “warm, hot” or *frig-* “cold”. In fact, the morpheme *tep-* “lukewarm” denotes a lower degree compared to a given reference point. It is either warmer than a given occasional reference point if we are dealing with the coldness argumentative scale or colder than a given occasional reference point on the warmth argumentative scale. Therefore, in both cases, whether we are dealing with the coldness scale or the warmth scale, the situation denoted by *tep-* is represented by a lower point compared to the reference point on the graphic representation of the scale.

Therefore, the meaning of *tep-* is “smaller quantity” (of warmth or cold), and it is similar to Engl. *temperate, moderate* with a possible double orientation. The Latin radical *tempera-* (verb *temperare* “temperate”) may also be used for a particular degree of temperature which is lower than warm on the warmth argumentative scale at the same time as being lower than cold on the coldness argumentative scale.

We can show two situations where *tep-* clearly has this meaning.

The first is a topographical description of plains, mountains and hills from an agricultural perspective. The author stresses the fact that the climate and, more precisely, the temperature are different in these three zones: plains are rather warm, mountains are rather cold, but hills are colder than plains and warmer than mountains, i.e., more temperate than the two other areas. In the following passage from Varro, the comparative form *tepidior*, literally “more lukewarm”, shows that the adjective *tepidus* displays a double orientated relative meaning, being both “warmer than a colder standard” and “colder than a warmer standard”:

Varro R. 1,6,2: *Igitur cum tria genera sint a specie simplicia agrorum, campestre, collinum, montanum ... sine dubio infimis alia cultura aptior quam summis, quod haec calidiora quam summa, sic collinis, quod ea **tepidiora** quam infima aut summa.*

“There are, then, with respect to the topography, three basic types of land – plains, hills and mountains ... undoubtedly a different agricultural production system is applicable to the lowlands than to the mountains, because the former are hotter than the latter; and the same is true of the hills, because they are **more temperate** than either the plains or the mountains”.

Secondly, in the case of the traditional Roman baths, the three rooms (*caldārium*, *tepidārium*, *frīgidārium*) are related to three zones of temperature and are denoted by the three morphemes *cal-* (*cald-*) “warm”, *tep-* (*tepid-*) “lukewarm” and *frīg-* (*frīgid-*) “cold”. These denominations are relatively objective, since they do not depend on a personal judgment. This seems, in fact, to be the most objective use we have in Latin for these temperature morphemes, since none of the three morphemes seems to have an axiological connotation. The three rooms in the Roman baths are complementary and used in the sequence: warm, lukewarm, cold.

Vitr. 5,10,1: *aenea ... tria ... unum caldarium, alterum tepidarium, tertium frigidarium.*

“three vessels made of bronze containing warm, lukewarm and cold water.”³⁵

Therefore, since the meaning of *tepidus* “lukewarm”, “of a moderate temperature” is based on a differentiation with a reference point and since this differentiation may be orientated either towards warmth or towards coldness, the precise orientation of *tepidus* requires further information to be drawn from the context.

4.2.2. First orientation: *tep-* “lukewarm, rather cold, too cold, cold”

The association of *tepidus* “lukewarm” with *prae-frīgidus* “very cold” (with *prae-* as an intensive suffix) orientates *tepidus* towards “rather cold” and even “cold” in the following:

Cels. 2,30,3 : *aqua uel tepida uel praefrigida.*

“either lukewarm (= almost cold) or even very cold water”.

In the same way, when someone complains about the *tepor* “lukewarm temperature” of the water in the baths, he means that the water is “not warm enough, too cold” compared to what he thinks would be the right temperature, since in the following example it has to be warm enough to wash some blood away:

³⁵ In these particular extralinguistic circumstances, we could say that both *tep-* in *tepidarium* and *frig-* in *frigidarium* are orientated on a temperature scale towards coldness: *tepidarium* denotes a higher degree on the coldness scale than *caldarium*, and *frigidarium* an even higher degree than *tepidarium* on the same scale. In this interpretation, the standard reference point for the whole procedure is the last stage (the cold bath). But conversely, if we suppose that the standard for the procedure is the first stage (the warm bath), then *tep-* and *frig-* are descending on the scale of *cal-*.

Tac. *Hist.* 3,32: *Is balneas abluendo cruori propere petit. Excepta uox est, cum **teporem** incusaret, statim futurum ut incalescerent.*

“He hurried to the baths in order to wash away the blood (with which he was covered). While he complained about the **lack of warmth** (of the water), a voice replied that they would immediately warm it up.”

The argumentative value in this case is “lukewarm, too cold” and even “cold”. The increase of the warmth of the water is denoted by the verb *in-cal-e-sc-e-re*, and, more precisely, by the ingressive preverb *in-* and the progressive suffix *-scere*³⁶

In its metaphorical utilisation, *tep-* refers to a “weak” literary style. In this case, the original concept of a lack of temperature has been transferred in order to express a lack of literary quality:

Tac. *Dial.* 21,6: *nisi forte quisquam aut Caesaris pro Decio Samnite aut Bruti pro Deiotaro rege ceterosque eiusdem lentitudinis ac **teporis** libros legit, nisi qui et carmina eorundem miratur.*

“You won’t tell me that anybody reads Caesar’s oration in defence of Decius the Samnite, or Brutus’s in defence of King Deiotarus, or any of the other speeches, all equally slow and equally **flat** – unless, indeed, it be someone who is an admirer also of their poetry.” (translation W. Peterson, 1970, Loeb Classical Library)

With the same kind of meaning, the superlative *tepidissime* “very weakly” is used by Augustine about the personified *consuetudo* “habit”, who is losing her power over Augustine and who, therefore, speaks to him with a very weak voice, lacking energy:

Aug. *Conf.* 8,27: *Sed iam **tepidissime** hoc dicebat.*

“But she was already saying it with a **very weak** voice.”

In other passages, the adverb *tepide* may metaphorically denote a decrease in the warmth of love, passion, and admiration.

Since *tep-* displays a depreciative meaning for a state lacking heat, this kind of use presupposes that warmth is in fact perceived axiologically, as a “good” thing in this particular cognitive domain.

4.2.3. Second orientation: *tep-* “lukewarm, rather warm, warm”

But unlike what we have seen above, in the following passage the adverb *tepid-ē* “in a lukewarm manner” corresponds to “keep warm”. It is therefore orientated towards “warm”. Columella writes that it is necessary to maintain a certain degree of temperature

³⁶ With the same progressive suffix, *tepē-sc-ē-re* means “become colder”.

above a lower limit in order to protect the chickens against the cold³⁷:

Col. 8,5,14 : *curandum erit ut **tepide** habeantur.*

"one has to be careful that the chickens are kept in a **lukewarm** temperature" = "warm enough, above a certain limit of warmth."

The argumentative functioning of the verb *tepid-ā-re* "to maintain a lukewarm temperature" (a denominative verb built on the adjective *tepidus*) is similar to this. It displays the meaning "keep warm" and is orientated towards warmth (i.e., "maintain a rather warm or less cold temperature") whenever, in its extralinguistic environment, coldness is perceived as being dangerous, e.g., when the cold weather kills the vines:

Plin. *Hist. Nat.* 17,250: *ne frigus uites adurat, circumfundunt riguis, quod ibi **tepidare** uocant*

"in order to impede the cold from burning the vines, they irrigate them, which they call *tepidare* 'maintain in lukewarm temperature'".

The radical *tep-* may also describe a feverish condition, i.e., a situation orientated towards the warmth of a real fever.

In fact, the most frequent uses of the progressive and ingressive verb *tepē-sc-ē-re* "become lukewarm" are orientated towards warmth: "rather warm" and even "warm". Similarly, the causative verb *tēpē-faciō* "make lukewarm" along with its frequentative *tēpē-fac-tā-re* have the meaning of "warm up with moderation". The passive form *tepe-fieri* is also used with the meaning "become moderately warm" alongside the past passive participle *tepe-factus* "slightly warmed up". The warming process seems to be more usual for the Latin speech community than the cooling process.

4.2.4. Both orientations may be found in the same passage

The following passage clearly shows that *tep-* has a differentiation function. The author here describes the remarkable variations of temperature in spring, depending on the different periods of day and night.

Quintus Curtius 4,7,22: *sub lucis ortum **tepida** manat, medio die, cuius uehementissimus est calor, frigida eadem fluit, inclinato in*

³⁷ Actually, in this case, the temperature must be maintained between a lower and an upper limit. The author only mentions the lower limit since, in the specific external environment discussed here, it is the dangerous limit and the peasant must be careful about it. This lower limit is what the peasant must endeavour to respect and the threshold he must avoid.

vesperam calescit, media nocte feruida exaestuatur, quoque nox propius uergit ad lucem, multum ex nocturno calore decrescit, donec sub ipsum diei ortum adueto tepore languescat

"at daybreak its flow is **lukewarm**, in the middle of the day, which is very hot indeed, the same fount is cold, as the day inclines towards evening it grows warmer, in the middle of the night it boils forth hot, and as the night approaches nearer to dawn, it decreases greatly from its nocturnal heat, until at daybreak it cools off to its normal temperature." (translation by J. C. Rolfe, 1971, Loeb Classical Library)

Lit. "after the night warmth, the temperature of the spring decreases until it languishes at its usual **lukewarm temperature**".

The value of the word *tepida* "lukewarm" in the first sentence of this passage is "(rather) warm" (= orientated towards warmth), compared to the following stage, the middle of the day, when the water is cold (*frigida*). But in the last sentence of the passage, the word *tepore* "lukewarm temperature" stands for "(rather) cold" (= orientated towards cold), since it is associated with the depreciative verb *languescat* "languish", here with a metaphorical use, while it usually denotes a lack of strength or intensity. At dawn, the temperature of the water decreases (*decrescit*), since it was boiling hot during the night (*feruida, exaestuatur, nocturno calore*).

Thus, in this passage, the *tep-* words are used successively both for "warmer" (than the following stage) and "colder" (than the previous stage).

4.2.5. *Tep-*: a quantifier for a small quantity

Its metaphorical uses (as we have seen in the passages quoted in § 3.5.2.) are part of the movement towards the grammaticalisation of *tep-* as a quantifier for a small quantity. *Tep-* then denotes a slight pungency of taste or smell.

This implies that the semantic content of *tep-* was mainly "a smaller quantity of (warm or cold) temperature" and, thus, "a small quantity of (warm or cold) temperature". We may decompose this content into two semantic features: /temperature/ and /small quantity/.

Subsequently, /temperature/ was treated as a specific feature and /small quantity/ as a generic one. With semantic extension, the semantic feature /temperature/ disappeared and *tep-* kept only the feature /small quantity/, becoming a mere quantifier deprived of any extralinguistic specificity.

5. SEMANTICO-REFERENTIAL CLASSIFICATION

We will now look at temperature using a semantic-referential classification. We will distinguish external temperature, e.g., meteorological (§ 5.1.) and other natural phenomena with their various manifestations, from internal temperature (§ 5.2.) where the locus is the human body. We will analyse the way in which the lexical items of temperature denote various degrees of temperature using the *-or* nouns³⁸, *calor*, *frīgus*, *feruor*, *ardor*, *algor*, *horror*.

5.1. Generic terms: the opposition 'warm' vs. 'cold'

The Latin lexicon shows an extralinguistic opposition between "warmth" and "cold", which probably exists in every human linguistic community and society as a basic cognitive category.

Thus, the two generic Latin nouns that denote warmth and coldness, *calor* (*-oris* M.) "heat, warmth" and *frīgus* (*-oris* Nt.)³⁹ "coldness, cold", are usually antonyms in the Latin texts, in prose as well as in poetry, being applied to natural entities (warmth for the sun vs. coldness for the rivers in Lucretius) and meteorological phenomena (wind and hail in Plautus):

Cic. *De inv.* 1,42: *Contrarium est quod positum in genere diuerso ab eo cui contrarium dicitur, plurimum distat, ut **frigus** **calori**, uitae mors.*

"*Contrary* is that which, placed in a class different from that to which it is said to be contrary, is as far as possible removed from it, for example **hot** and **cold**, life and death" (Translation by H.M. Hubell, Loeb Classical Library, 1949).

Lucr. 4,218-220:

*Perpetuoque fluunt certis ab rebus odores; **frigus** ut a fluuiis, **calor** ab sole, aestus ab undis aequoris ...*

"Some smells continuously spread out from certain entities; in the same way as **cold** from rivers, **heat** from the sun, spray from the waves of the sea..."

Pl. *Mer.* 860: ***nec calor nec frigus** metuo neque uentum neque grandinem.*

"I fear **neither heat nor cold**, wind nor hail".

38 For their general cognitive and semantic features, see above § 1.

39 "Atmospheric cold, cold weather".

The referential opposition between heat and cold is also expressed by the usual lexical antonymies between the related adjectives *calidus* “warm” and *frigidus* “cold”, which are built with the *-idus, -a, -um* (*-dus, -a, -um*) suffix behind the radicals *cal-* and *frīg-*.

Each of these radicals builds a set of three lexemes⁴⁰ which are in a complementary distribution both for morphology and syntax while they denote the same extralinguistic state-of-affairs: a) as a noun in *-or* M.; b) as an adjective in *-idus, -a, -um*; c) and as a stative verb in long e.

The radical *cal-* is thus the morphological basis for *cal-or* “warmth” / *cal-idus* “warm” / *cal-e-re* “be warm”, while *frīg-* is the basis for *frīg-us* (*-or-is* Nt.) “coldness” / *frīg-idus* “cold” / *frīg-e-re* “be cold”.

The four words *calor, calidus* and *frīgus, frīgidus* are the main Latin representatives of the temperature class of nouns, since they display the highest frequency in the texts. The frequency of the verb *calere* is also significant, while the verb *frīgere* is less frequent⁴¹.

The opposition of temperature warm vs. cold is in parallel to that of humidity vs. dryness (*humor* “humidity” vs. *ariditas* “dryness”), as can be seen in the following example from Ennius:

Enn. *Var.* 46 V= *Varia, Epicharmus* 2W (*apud* Varro L. 5,60):
Frigori miscet calorem atque humori aritudinem.
 “He mingles heat with cold and dryness with moisture.”

5.2. The heat of boiling water: *feru-*

While *cal-* builds generic terms, *feru-* builds specific ones for very high temperature and, more precisely, for the temperature of boiling water. *Feruor* can qualify naturally hot water and hot springs:

Plin. *Hist. Nat.* 31,20 : *Cramonne est fons calidus citra summum feruorem.*⁴²

⁴⁰ This property is not limited to the temperature words. These sets are documented for most of the *-or* nouns: see above § 1 and 2.

⁴¹ The number of occurrences in the LASLA corpus (1981) is: *calor*: 68 (= prose 48 + poetry 20); *calidus*: 49 (= prose 22 + poetry 27); *frigus*: 105 (= prose 51 + poetry 54); *frigidus*: 89 (= prose 27+ poetry 62); *calere*: 38 (= 16+ 22); *frigere*: 4 (= prose 1 + poetry 3). Other words found for extreme cold are: *gelu*: 17 (= 7+10); *gelidus*: 70 (= 4+ 66); *algor*: 2 (= 2+0); *algidus*: 1 (= 0+1); *rigere* “be stiff” and in particular “be stiff with cold”: 23 (=9+14); *rigidus* “stiff” and in particular “stiff with cold (death, etc.)”: 26 (=7+19); *hibernus, -a, -um* “concerning winter” and in particular “very cold”: 44 (=14+30); *hiems* “winter” and sometimes “cold and bad weather”: 124 (=74+50); for extreme (boiling) heat: *feruor*: 21 (=15+6); *feruidus*: 36 (15+21); *feruere*: 36 (=4+32); for extreme (fire) heat: *ardor*: 49 (32+17); *ardere*: 133 (=39+94). As we can see from these figures, the adjective *gelidus* “iced” for extreme cold is also frequently found, but more often in the poetic vocabulary. The high frequency of the verb *ardere* is due to its many metaphorical uses.

⁴² In the scientific language of Pliny the Elder here, *calidus* is the generic term while *feruor* is a specific term.

“In Crannon is a hot spring which just falls short of **boiling**”
(lit. “a warm spring, which is just under the highest boiling point”).

This passage illustrates the argumentative use of *cal-* and *feru-*. The literal translation would be “a hot spring which is just under boiling”. The water coming out of this hot spring is so hot that it is almost boiling. Therefore, the argumentation involved is “warm and even boiling”. On the argumentative level, the writer wants to impress the reader here by presenting the boiling point as an argumentative tendency. But at the same time, on the denotative level, Pliny says that this very warm water does not reach the boiling point.

Feruor may also be used about hot water and steam in the Roman baths, and it may be applied to a high temperature resulting from human activity. It is associated with *aestus* (*-tus* M.) “heat” in the following passage:

Liu. 23,7,3: *balneis includi iussit ubi **feruore** atque aestu anima interclusa foedum in modum exspirarent*

“(the populace) ordered them all to be confined in the baths, that there they might die a terrible death, being suffocated by the **extreme heat**.” (Translation by F. Gardner-Moore, 1940 (1966), Loeb Classical Library).

Feruor may also denote hot weather, the hot season. In this semantic extension, the concrete element where the temperature takes effect has been eliminated from the semantic content of the word. The dominant semantic feature is now “extreme heat”, and it may be applied to any source of extreme heat and, prototypically, to burning by the sun:

Sen. *Quaest. Nat.* 4a,2,1: *usta **feruoribus** terra*
“the land which had been burnt by the **torrid heat**”.⁴³

From this meaning “heat of the sun” was probably developed, in the metaphysical vocabulary, the use of *feruor* referring to the vital principle of the universe:

Cic. *De nat. deor.* 2,30: *mundi ille **feruor** purior perlucidior ...aptior ad sensus commouendos quam hic noster **calor** quo haec quae nota nobis sunt retinentur et uigent.*

“That **glowing heat** of the world is far purer and more brilliant ... and more stimulating to the senses than this **warmth** of ours by

43 The noun *feruor* applied to the sun may be associated with *uapor* “natural steam”: Lucr. 6,237: *solis uapor ... pollens feruore corusco*. “the heat of the sun ... that is powerful thanks to its glittering fires”.

which the things that we know are preserved and vitalized.” (Translation by H. Rackham, 1933 (1967), Loeb Classical Library).

In this passage, *feruor* is a hyponym (or specific term) for the extreme heat of the universe, since it is opposed to *calor*, which is the unmarked and generic term for normal heat experienced by man on earth.

5.3. The heat of fire: *ard-*

Another noun is situated very high up on the temperature scale: *ardor* “fire, burning”⁴⁴. It refers originally to the temperature of fire. It denotes the fire produced by lightning in the following example, where it is associated with *feru-* in the adjective *prae-feruidus*⁴⁵:

Accius *Inc.* 16-17W: *praeferuido fulgure ardor iniectus Iunonis dextera ingenti incidit.*

“and the **fire** (*ardor*) from burning (*praeferuido*) lightning (*fulgure*) cast by Juno’s great right hand fell upon him”.

5.4. Very cold temperature

While *frīgus* and *frīgīdus* are the hyperonyms and generic terms for cold, the specific terms or hyponyms denote extreme cold, such as *gelīdus* “ice cold”⁴⁶ (derived from *gelu* “frost”) and *algor* (-ōris M.)⁴⁷, referring to icy weather. This last noun is opposed to the extreme heat of fire (*ignis* “fire”) in the poetic language of Lucretius:

Lucret. 3,622-623 : *neque flamma creari/
fluminibus solita est, neque in igni gignier algor*
“flame is not created in rivers nor **ice** in fire”.

In the scientific prose of Pliny the Elder, besides the generic *frīgīdus*, *algor* (*algoribus* here) is a specific term for the winter season (*hibernis* here “concerning winter”):

44 It is used for the region of the sky considered as being the ether, called *aethēr* in Latin (a word borrowed from Greek αἰθήρ) “the upper region of space”, e.g., the fire supposedly situated above the air. Thus Lat. *ardor caeli*, a two-word expression for the translation of Gr. αἰθήρ, means literally: “the burning of the sky”.

45 For *prae-* in this intensive function, see above § 3.3.1.

46 For the high frequency of *gelīdus* especially in poetry, see above note 34.

47 *Algor* has a low frequency in the Latin texts. See above note 34.

Plin. *Hist. Nat.* 29,10 : *repente ciuitatem Charmis ex eadem Massilia inuasit, damnatis non solum prioribus medicis, uerum et balneis, frigidaque etiam hibernis algoribus lauari persuasit. Mersit aegros in lacus. Videbamus senes consulares usque in ostentationem rigentes.*

"suddenly the state was invaded by Charmis, also from Massilia, who condemned not only previous physicians, but also hot baths, persuading people to bathe in **cold** water even during the **winter frosts**. His patients he plunged into tanks, and we used to see old men, consulars, actually **stiff with cold** in order to show off." (Translation W. H. S. Jones, Loeb Classical Library).

5.5. Internal temperature

The same words are generally used for external and internal temperature, i.e., body temperature as felt by a human being or an animal. There is a strong extralinguistic relationship between the external and the internal, since an external cold may induce an internal feeling of cold. Some hyponyms used for external temperature may have been extended to internal temperature (*feru-*, *alg-*), but since both domains are interdependent and fundamental for human beings, it is likely that the generic terms have always been applied to both domains.

Apart from its external atmospheric meaning, *algor* "extreme cold" is used for the unpleasant cold as felt by living organisms (men or animals), producing shivering and stiffness. It is mentioned among the difficulties a soldier has to suffer: cold, hunger and lack of sleep⁴⁸. In the following passage, Varro writes that a cold place is dangerous for the health of cows:

Varro *R.* 2,5,15 : *Et prouidendum quo recipiunt se ne frigidus locus sit ; algor enim eas et famis macescere cogit;*

"Care should also be taken that the place into which they are turned shall not be **chilly**, for **chill** and hunger make them (the cows) grow thin".

In fact, cold in the Latin texts generally carries a depreciative axiological value⁴⁹.

The radical *feru-*, originally referring to the extreme heat of boiling water, may also denote a burning sensation felt by a living

48 Sall. *Catilina* 5,3: *corpus patiens inediae algoris uigiliae* "a body enduring hunger, cold, lack of sleep."

49 For more details, see below § 7.

organism, a high temperature of the body, a fever. In the following passage, three lexical items denoting warmth and fever co-occur: *calidus* "warm", *febris* "fever", *feruor* "heat":

Lucr. 6,656:

Numquis enim nostrum miratur, siquis in artus/

*Accepit calido febrim **feruore** coortam/*

Aut alium quemuis morbi per membra dolorem?

"Would any one of us be surprised if someone felt in his limbs a fever issued from a warm **burning sensation** or felt another pain (whatever) due to a disease that had spread throughout his whole body (all over his body)?"

lit. "a fever (*febrim*) born out (*coortam*) of a warm (*calido*) heat (*feruore*)".

Of course, in such cases where heat is a disease and therefore a "bad" thing, coldness becomes a "good" thing with the axiologically laudative meaning "cool, refreshing":

Plin. *Hist. Nat.* 15,19 : *Oleo natura tepefacere⁵⁰ corpus et contra algores munire, eidem feruores capitis **refrigerare**.*

"Olive-oil has the property of imparting warmth to the body and protecting it against cold, and also **cooling** the head when heated." (Translation H. Rackham, 1945, Loeb Classical Library)

But usually *frīgus* and *algor*, when applied to the human body, are unpleasant and dangerous. The cold sensation or chilliness they refer to may be caused by some disease, fear, lack of strength and energy, a kind of numbness, torpor, or, more drastically, by a lack of bodily heat due to death.

6. COGNITIVE TRANSFERS AND METAPHORS

Temperature processes are often used as standards in cognitive metaphors.

Sometimes, the lexemes denoting heat and coldness in natural phenomena are applied to illnesses and pathological states of the human body or mind in a metaphorical way (cf. § 5.5. for *feru-*, *ard-*, *alg-*)⁵¹.

50 In this passage, *tep-* in the causative verb *tepefacere* "make lukewarm" denote a moderate temperature, as opposed to both excessively unpleasant cold (*algores*) and heat (*feruores*) felt by the human body. See above § 4.2.

51 The metaphorical transfers usually occur in the opposite direction, the standard for metaphors being normally the human body, since, in a cognitive perspective, the human body is the source of perception and, therefore, of denomination. But the generic terms for temperature were probably originally used for both external and internal temperature; see § 5.5

Latin temperature terms also underwent other semantic extensions and metaphorical transfers.

6.1. Cognitive metaphors involving heat

Feru- “boiling heat” may be applied to a human being when it refers to a physically (cf. above § 5.5.) or psychologically “bad” situation: a disturbance, an unrest of the mind, a vehement passion⁵², a paroxysm or anger⁵³. We have also already mentioned the semantic extension that leads to the general meaning “very high temperature”, without any reference being necessary to water.

In another metaphorical transfer, *feruor* is applied to the agitation of sea water in a storm. The underlying meaning is: “agitation of a liquid that looks like the agitation of boiling water”. The salient extralinguistic feature that has been selected for such a transfer is not temperature, but the disordered movements of the sea that looks like the bubbling of boiling water:

Cic. *De nat. Deor.* 3,24 : *quid Oceani **feruore** illis in locis... ?*

“What occurrence (do you think could be more regular ...) than the **eddying** ocean-**currents** in the region where ...?” (Translation H. Rackham, Loeb Classical Library).

Lucr. 6,436-437: *uenti / uis ... **feruorem** mirum concinnat in undis*

“the strength of the wind produces a prodigious **agitation** in the sea”

The same bubbling has been selected as a salient feature by Varro when he uses *feruor* for the fermentation of wine (Varro *R.* 1,13,6).

The radical *ard-* “burning, fire” also undergoes a metaphorical transfer when it is used to denote passion. In the following passage from Cicero, it is used metaphorically for the description of a desperate political situation, along with another word normally reserved for fire, the noun *deflagratio* “destruction by fire” (a *-tiō* suffixed noun functioning as the process noun of the verb *deflagrare* “burn down”, and derived from its verbal stem *dēflāgrā-*):

⁵² *Feruor* may also be applied to the passion of age displayed by young people. In the *De senectute*, Cicero presents this as a “bad” thing, opposed to the wisdom of an old man: Cic. *De sen.* 45: *erat quidam feruor aetatis.*

⁵³ *Feruor mentis* literally “boiling of the mind” is associated with anger (*iracundia*) in: Cic. *De oratore* 1,220: *Quis enim umquam orator magnus et grauis, cum iratum aduersario iudicem facere uellet, haesitauit ob eam causam quod nesciret quid esset **iracundia**, **feruorne** mentis an cupiditas puniendi doloris?* “For what grand and impressive orator, trying to make an arbitrator angry with his opponent, was ever at a loss merely through not knowing whether **wrath** is a **vehement heat** of the mind, or a strong desire to avenge pain?” (Translation by E. W. Sutton, 1942, Loeb Classical Library).

Cic. *Pro Plancio* 95: *cum mea domus ardore suo deflagrationem urbi atque italiae toti minaretur*

“when the **blazing** ruins of my home threatened to involve in their **flames** the city and the whole of Italy” (Translation N. H. Watts, 1923 (1965), Loeb Classical Library). Lit. “when my house, by its **blazing** ruins, was threatening to burn down the city...”.

The noun *uapor* “steam, exhalation” often refers to a vapour coming from something which has been heated (e.g., from a boiling liquid). It may be applied to the vapour coming out of the ground due to the heat of the sun, or to the hot steam in the baths. But it may also denote a fever, heat caused by a disease, or a psychological state involving abnormal behaviour with the meaning “excited state of mind”. Since the original meaning of *uapor* is concrete, this use results from a metaphorical transfer.

6.2. The opposition heat vs. coldness in cognitive metaphors

Heat and cold may be perceived as a quality in plants and, thus, in food. The following passage from Pliny shows that the plant called *lactūca* “lettuce” (> Fr. *laitue*) was perceived as “very cold” (being the locus of an excessive cold: *nimio frigori*), while the plant called *ērūca* “rocket” (Fr. *roquette*) was considered as “hot” (being the locus of heat: *feruor*):

Plin. *Hist. Nat.* 19,155: *ut nimio frigori (lactucae) par feruor (erucae) inmixtus temperamentum aequet*

“so that the great heat (of the rocket) mixed with an equal part of the excessive cold (of the lettuce) produces a temperate product.”

Feruor “great heat” was assigned to *ērūca* “rocket” (*Eruca sativa*) since it is a bitter herb which may have been used as an aphrodisiac, while lettuce was associated with coldness (*frigus*). This because the Latin denomination *lactūca* was synchronically motivated by association with *lac* (gen. *lactis* Nt.) “milk”⁵⁴.

Moreover, this passage from Plinius refers to the well-known mixture of two opposite entities in order to produce a more moderate one and thus to obtain a *temperamentum* “a moderate temperature state”.

6.3. Cognitive metaphors involving coldness

A proverb such as *aquam frigidam suffundere* (Pl. *Cist.* 35) means “speak ill of someone”. Its literal translation “pour **cold** water

⁵⁴ Originally the lettuce was denominated by the selection of its salient extralinguistic feature, the white juice that comes out of its stem. This white juice was metaphorically associated with milk which is the prototypical white liquid: *lac* (*lact-is* Nt.) “milk” · *lact-ūca* (-ae F.) “lettuce”, literally “plant characterized by milk”.

on (someone)" shows the depreciative value attached to cold water and, therefore, to coldness in general. This depreciative value is illustrated in the metaphorical uses of the words referring to cold.

6.3.1. *A cold feeling*

In another metaphorical transfer, where it is applied to the feelings of man, the morpheme *frīg-* refers to a lack of affection, an unfavourable reception, indifference, a cool relationship⁵⁵. This metaphor for "cold feelings" is also found in English and French: *he received a cold welcome*; Fr. *il reçut un accueil très froid*.

The ingressive and progressive verb *frīgē-sc-e-re*⁵⁶ can thus take the meaning "become cold towards someone, loose affection for someone", the person who is the source of the feelings being expressed by the grammatical subject with the stimulus taking the dative. The verb describes a change of feelings, from warm to cold in a personal relationship.

The state verb *frīgē-re* "be cold, be inert, have no affection for" is applied to the political position of someone (*Curio*) in the following ironical passage from a letter sent to Cicero. The passage displays a progression from *frīg-* "cold" (*ualde frigere*) to *cal-* "warm" (*calet*) and *feru-* "boiling hot" (*feruentissime*):

Cic. *Cael. Fam.* 8,6,5 : *Quod tibi supra scripsi, Curionem **ualde frigere**; iam **calet**. Nam **feruentissime** concerpitur. Leuissime enim ... transfugit ad populum et pro Caesare loqui coepit.*

"I wrote you above that Curio **was very cold**; well, he is **warm** enough now; he is being pulled to pieces with **red-hot** pincers. The fact is that in the most capricious way, ... he has crossed over to the popular side and is beginning to orate in favour of Caesar" (translation W. Glynn Williams, 1929, Loeb Classical Library).

However, the verb *frīgere* "be cold" may also, somewhat surprisingly, be applied not to the source of the feeling (the person that produces the feeling), but to the stimulus that provokes the feeling. When the grammatical subject of *frīgere* is the stimulus, the verb then means "be disliked, be unfavoured, not be favoured":

Cic. *Verr.* 2,60 : *cum omnia consilia **frigerent***

"since all the propositions had a **cold** reception"

(Fr. "comme toutes les propositions étaient accueillies **froidement**").

55 Cf. *frīgus* Hor. *S.* 2,1,62. "indifference, cool relationship".

56 See above for the formation of this verb.

Cic. *Phil.* 6,14: *iacent beneficia Nuculae, **friget** patronus Antonius.*
 “the favours of Nucula are at a discount; Antonius’ patronage market is flat.” (Translation W. C. A. Ker, 1926 (1969), Loeb Classical Library).

Lit. “Antonius as a patron is **cold** (= disliked).”

The grammatical subject of *frīgere* may be extended to designate a flute player who is not favoured by the public⁵⁷:

Cic. *Brutus*187 : *discipulo sane **frigenti** ad populum.*
 “a disciple whom the public did not appreciate at all”.

6.3.2. Cold = weak

In a more abstract use, coldness may be applied to the way someone speaks or writes, with the meaning “flatness, weakness”. This exemplifies another transfer of the notion of coldness to other activities of mankind. The morpheme *frig-* may be used for someone who is not a good orator. After having illustrated Caligula’s cruelty with a number of drastic arguments, Suetonius writes that any other facts he could mention would not be as strong as the previous ones:

Suet. *Caligula* 26,1: *Leue ac **frigidum** sit his addere quo propinquos amicosque pacto tractauerit...: quibus omnibus ... mors persoluta est.*

“After this, it would be unimportant and **trite** to add how he treated his family and friends ...; all of them ...were killed.”

In such uses, the notion of coldness appears to be interpreted as a lack of quality. Therefore, the underlying idea must be that the opposite notion, warmth, is a “good” thing.

6.4. Cognitive metaphors with *tep-* “lukewarm”

The radical *tep-* “mild heat, lukewarm, moderate temperature”⁵⁸ is also subject to metaphorical transfer, being used for human feelings and, in particular, for love. Its double argumentative orientation, that we have illustrated above (see § 4.2.), is also shown in its metaphorical uses. When orientated towards the meaning “warm-er”, the state verb *tēp-ē-re* “be lukewarm” means “start feeling the warmth of love”. But when oriented in the opposite start losing warmth in love, have a moderate degree of love” (*Ov. Rem. Am.* 629 and *Met.* 11,225.). In this latter orientation, it functions as a relative-to-previous-state term.

57 Cf. Cic. *Fam.*11,4,1; *Att.*1,14,1.

58 See above for the lexical set built on *tep-* (§ 2.2.) and its argumentative values (§ 4.2.).

7. AXIOLOGICAL VALUES OF LATIN TEMPERATURE TERMS

Lexical data give us clues to how the various extralinguistic notions were perceived by the speech community. We will here look at the axiological values displayed by temperature lexemes. As we have already seen, warmth is generally a good thing in the Latin texts, while coldness is rather bad⁵⁹. But there also exist extralinguistic situations where heat is disliked, while cold is favoured.

7.1. Heat as a good thing and cold as a bad thing

In the Latin texts, heat is usually perceived as a productive process and a factor of creation (*gignit*) of new entities, while cold is considered as sterile (*sterile*) and unfruitful, as seen in Seneca's scientific prose, Cicero's philosophical prose and Caesar's narrative text:

Sen. *Quaest. Nat.* 2,10,4: *sterile frigus est, calor gignit.*
"Cold is sterile, warmth is a source of generation".

Cic. *De nat. Deor.* 2,26 : *de ... eo **calore** ex quo omnia generari dicebas.*
"from the **warmth** from which you said that all things are generated."

Caes. *B.G.* 1,16,2: *propter **frigora**, quod Gallia sub septentrionibus ... posita est ..., frumenta in agris matura non erant.*
"Because of the **cold weather**, since Gaul is situated in the northern regions, the cereals (wheat) were not mature in the fields".

7.2. A depreciative value for cold

In this use, the morpheme *frīg-* denotes a zone situated in the lower part of the argumentative scale orientated towards warmth (denoted by *cal-*). This use of *frīg-* for atmospheric and meteorological phenomena has the highest frequency in the Latin texts and it is usually depreciative. The consequences of external cold are unpleasant.

⁵⁹ See above § 5.5. and § 6.3.

A number of bad and pathological states are presented as the consequences of cold, especially among the *-or* nouns⁶⁰.

Horror refers to the action of rising or standing stiffly, usually for hair. This situation may be caused by cold.

Rigidity of the body (cf. Lat. *rig-* in *rigere* "be stiff", *rigidus* "stiff", *rigor* "state of being stiff") is often presented as arising from cold⁶¹.

The *frīg-* morpheme is also used for a lack of activity and a languishing behaviour for a person⁶², or for dull or weak speech or text⁶³.

Fear and cold can also be associated together. In the following passage, extreme fear (*pauor, torpor*) is associated with a cold sweat (*frigidus sudor*)⁶⁴:

60 Cf. § 1. Physiologically unpleasant phenomena that are dangerous for man and domestic animals: *dolor* "pain", *labor* "painful task", *languor* "weariness, illness, inactivity", *macor* "thinness" (Pacuvius *Trag.* 275), *pallor* "paleness of complexion, pallor", *pigror* "sluggishness" (Lucilius 391: *pigror torporque*), *squālor* "dirtiness", *sūdor* "sweat", etc. Psychologically abnormal states also belong to the domain of *-or* (cf. *error*), along with loss of consciousness and loss of motion or activity: *sōpor* "deep overpowering sleep, catalepsy, (drunken) stupor, torpor", *torpor* "loss of physical power, paralysis, unconsciousness, paralysis of will". The same semantic-referential features are seen in the following words: *stupor* "state of being insensible, torpor, stupefaction", *marcor* "apathy, languor" (Cels.; Sen. *Dial.* 9,2,10: *inde maeror marcorque et mille fluctus mentis incertae*; Sen. *Ep.* 104,6: *Non permansit marcor ille corporis*), *pāuor* "panic", *terror* "extreme fear, terror", *timor* "fear", *tremor* "action or state of trembling from fear, cold, illness". The cognitive features of the *-or* nouns are clear when we compare *tremor*, referring to an extreme, physiologically unpleasant process, with the noun *metus*, *-us* M. "intellectual fear, apprehension". The latter stands here as a counter-example, associated with the verb *metuo* "be afraid, foresee a problem", denoting an intellectual process that is not strong enough to involve physiological consequences.

61 Cf. *stringor* "astringent or contracting quality" due to cold water: Lucr. 3,693: *gelidai stringor aquai*.

62 With metaphoric transfer from the military domain. Cicero writes to Trebatius Testa, who was in Gaul (he was a lawyer and not a soldier): Cic. *Fam.* 7,10,2 *Sed tu in ista epistula nihil mihi scripsisti de tuis rebus... Valde metuo ne frigeas in hibernis; quamobrem camino luculento utendum censeo... Quamquam uos nunc istic satis calere audio; quo quidem nuntio ualde mehercule de te timueram*. "But you told me nothing in your letter about your affairs ... I am very much afraid that you **feel the cold in your winter-quarters**, and for that reason, in my judgment, you should have a nice bright stove ...But... I hear you are now **having quite a hot time** of it over there – a bit of news that, I assure you, filled me with alarm on your account".

63 Cic. *Fam.* 10,16,1 : *...cum is frigidus sane et inconstantes recitasset litteras Lepidi*. "...after he had read out the despatch of Lepidus, and a **bleak and shuffing** communication that was" (Translation by W. Glynn Williams, Loeb Classical Library, 1929).

64 Cf. a shivering due to fear: *frīgus*: Verg. *En.* 1,92.

Plin. *Hist. Nat.* 29,90: *Scorpionibus contrarius maxime inuicem stelio traditur, ut uisu quoque **pauorem** his adferat et **torporem frigidi sudoris**.*

"The *stelio* is said in its turn to be such a great enemy to scorpions that the mere sight of one strikes them with **panic** and **torpor** with **cold sweat**."

A feverous shivering may also be denoted by a word linked with a cold temperature. The masculine noun *frīgor* was created for "feverous shivering" within the medical vocabulary⁶⁵. This specific masculine term *frīgor* is thus a different lexical item from the usual neuter noun for cold, *frīgus*.

The neuter grammatical gender of *frīgus* is probably cognitively motivated, which illustrates the role played by another cognitive factor in the temperature vocabulary. The noun *frīgŭs, -ōris* Nt., the usual generic term for "cold", is classified within the *-or* masculine nouns, although it has a neuter grammatical gender. But a cognitive reason may explain this exceptional neuter gender: it may be due to the salient feature of the notion of 'cold' itself which may imply an inanimate extralinguistic feature⁶⁶. Coldness is a factor of paralysis, torpor, lack of energy and movement. For body temperature, *frīg-ŭs* is used for the cold of death⁶⁷. The notion denoted by *frīgus* displays a high degree of inanimacy, as is shown in many occurrences, e.g., by its association with the adjective *iners*, which determines *frīgus* in the almost fixed expression, *frigus iners*⁶⁸.

7.3. Cold as a good thing: "refreshing"

Coldness may also be perceived as a good thing, as Engl. *fresh, refreshing*, in certain precise speech situations.

The verb *frīgĕr-ā-re*⁶⁹ and the preverbed verb *(re-)frīgĕr-ā-re* mean "refresh something, cool something down" with a causative

65 The masculine noun *frīgor* (*-ōr-is*) "cold shivering", documented only in Late Latin (in particular, Augustine *Sermones* 40,1 Mai), was created analogically within the medical vocabulary in the sub-group of the *-or* nouns denoting pathological states: *tumor* "swelling", *aegror* "sickness", *angor* "anxiety", *furor* "violent madness", *albor* "glaucoma".

66 In this case, the grammatical and the extralinguistic gender (i.e., the opposition between animate and inanimate entities) are congruent.

67 Cf. Lucr. 3,401; Verg. *En.* 2,951; G. 4,525; Ov. *Met.* 14,743.

68 Ov. *Met.* 8,788-791 : *Est locus extremis Scythiae **glacialis** in oris, / Triste solum, sterilis, sine fruge, sine arbore tellus; / **Frigus iners** illic, habitant Pallorque Tremorque / Et ieiuna Fames.* "In the most remote parts of Scythia, there is an **icy** place, with dark soil and sterile ground without any cereals and without any trees. There live **torpid Cold**, Pallor and Shivering, as well as hungry Starvation".

69 Built on the noun *frigus*. See above § 5.5.: Plin. *Hist. Nat.* 15,19: *feruores capitis refrigerare*.

meaning⁷⁰. The semantic content of the *re-* preverb in this verb is the fact of going back to a previous state that was good and of eliminating an excess of heat. This restoring meaning implies that, in a hostile environment, a decrease of heat, which is an increase of cold, is a good thing. The argumentative scale, in this case, is orientated towards coldness.

8. NON PROTOTYPICAL LEXEMES FOR THE EXPRESSION OF TEMPERATURE

Certain other Latin, specific lexemes refer to temperature situations encountered mainly in nature.

The heat of the hot season may be expressed by *aestus* (gen. -*tūs* M.)⁷¹. The usual denomination for summer is *aestās* (gen. sg. *aestātis* F.)⁷².

Frost is used in order to refer to cold: *gelū*, -*ūs* Nt. (or *gelus*, -*ūs* M.; *gelum*, -*ī* Nt.). Cato warns the farmers against frost⁷⁴. The adjective *gel-idus* denotes, mostly in poetry, very cold and icy atmospheric conditions. It is also applied to what is normally or what has been warm, e.g., for dead or dying persons, for persons under the effect of severe fear, etc. But in a few occurrences, *gelidus* refers to a "good" state-of-affairs as "refreshingly cold, ice-cold"⁷⁵.

Ice (*glaciēs*, -*ei* F.)⁷⁶ may be used as a standard entity⁷⁷ for extreme cold.

70 Cf. Catull. 61,30.

71 The noun *aestus* comes from an I.-E. root "burn, fire, extreme heat", followed by the inherited suffix *-*tu-*, used in order to build process nouns; *aestus* is also a usual temperature term, which may be associated with *feruor*, as seen in § 5.2. in the passage Livius 23,7,3.

72 Built on the same I.-E. root as *aestus* M., but with the feminine suffix -*tāt-*.

73 Lat. *gelu* is diachronically a cognate of Germ. *kalt*, Engl. *cold*.

74 Cato Agr. 40,4: *stramentis circumdato ... ne gelus noceat*. "wrap it with straw so that the **frost** does not damage it". 75 Cic. *De diuin.* 63: a poetic use; Verg.; Ov.

76 On *glaci-* "ice" are built: *glaci-ālis* "icy" (Verg.: *glacialis hiems* "icy winter"), *glaci-esco*, *glaci-are* "turn into ice" (cf. Plin. *Hist.Nat.* 4,87: *glaciato freto* "a frozen sea").

77 Ov. *Pont.* 10,32: *frigidior glacie ... fui* "I was colder than ice".

Snow (*nix*, gen. *niuis* F.)⁷⁸ may refer indirectly to extreme cold⁷⁹. But snow sometimes has a good axiological value⁸⁰, e.g., when used in order to cool a drink⁸¹ or a pool in hot weather⁸².

Hail⁸³ may be associated with moderate cold (*grandō*, gen. *grandin-is* F.).

Brūma (-ae F.)⁸⁴ "winter solstice" may also mean "winter, the cold of winter, wintry weather" (with a metonymical shift) especially in poetry. It is then qualified by *iners* "deprived of vitality" and "which takes the vitality away", just like any other noun denoting cold⁸⁵. When the winter is mild, *bruma* is qualified by *tepidus* "lukewarm"⁸⁶, i.e., "moderate compared to the usual temperature", "warmer than usual", "less cold than usual" by differentiation from "cold".

Shade is also linked with coldness: *opācus* "sheltered from the heat and light of the sun, shad" may be used as a qualification for *frīgus*⁸⁷.

78 The unipersonal verb *nīuit* "it snows" belongs to a small set denoting atmospheric events: *pluit* "it rains", *grandinat* "it hails".

79 Cf. the derived adjectives *niu-eus* "as cold as snow", "(drink) chilled with snow" and *niu-ālis*.

80 The salient feature selected for snow is usually its pure white colour (*candidus* "pure white") with an axiologically laudative connotation.

81 Cf. the adjectives *niu-ārius* "relating to snow as used for cooling drinks"; *niu-ātus* "cooled with snow" for drinks (Seneca) and water (Petronius).

82 Suet. *Nero* 27,2: *refotus saepius calidis piscinis ac tempore aestiuo niuatis*. "(Nero) reinvigorated very often in **warm** pools and, when it was very hot, in pools **cooled with ice**".

83 Cf. Sen. *Quaest. Nat.* 4b,4,1: *quaeritur autem quare hieme ningat, non grandinet, uere iam frigore infracto grando cadat*. "A common question is why does it snow in winter but does not hail, yet hail falls in spring after the cold is broken" (Translation T. H. Cotcoran, 1972, Loeb Classical Library).

84 Which means etymologically "the shortest day (of the year)" from **breuima*.

85 Lucr. 5,746: *bruma niues adfert pigrumque rigorem reddit hiemps*; Hor. *Carm.* 4,7,12: *bruma ...iners*.

86 Hor. *Carm.* 2,6,18.

87 Verg. *Buc. (Eclog.)* 1,52.

9. CONCLUSION

9.1. A natural and physical cognitive domain

The Latin temperature vocabulary displays some similarities with other domains of the Latin lexicon dealing with natural categories. The temperature nouns are suffixed in *-or* (*-ōr-is* M.) and belong to the cognitive class of natural and physical states-of-affairs that are not under the control of man. They share this property with the nouns denoting colours (Lat. *color* "colour", *rubor* "red colour", etc.).

9.2. A very specific lexical domain

However, the thermic vocabulary is more complex than the chromatic one. It is organized in more complex lexical sets. The numerous temperature verbs introduce more precision in the denotation of their processes. With temperature, we have micro-systems where the terms are in a complementary distribution, denoting an action, a progression (transformation, beginning of the process), a quality or a state resulting from a completed process. In particular, one type of verbal formation is well documented for temperature and indeed is mainly found in the temperature domain: the *cale-facio* "warm (something)" causative type.

The temperature lexical area is important. Latin uses a great number of its lexico-morphological resources in order to denotate states-of-affairs, processes and entities in a manner that is as precise as possible.

9.3. Latin and Romance languages

Most of the Latin temperature lexemes we have studied above (essentially those based on the three radicals *cal-* "warm", *frīg-* "cold", *tep-* "lukewarm") must have had a high frequency in the spoken language throughout all periods of Latin, since they are generally maintained in the Romance languages: e.g. *frīg-idus* > Fr. *froid*, etc.; *calidus* > Fr. *chaud*, etc.; *tepidus* > Fr. *tiède*, etc.; *gel-idus* > Fr. *gelé*, etc.

Therefore, the temperature lexemes must have belonged to the Latin fundamental vocabulary and the more so since they referred to basic cognitive categories. As is to be expected, a fundamental part of everyday life generated lexical items that are a part of the basic vocabulary of the language and, conversely, the fundamental status of the Latin temperature lexemes is a clue to the central role of temperature in the cognition of the members of the Latin speech community.

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