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Diachrograms – a theoretical framework for the modelling and analysis of a heritage artefact's diachronic evolution.

Extension of the model and of the corresponding visual formalism.

I. Dudek, J.Y. Blaise

30/09/2020

Introduction

Naturally various methods may be used to investigate the past of a given object. The concepts of *synchrony* and *diachrony* were introduced into language analysis by Ferdinand de Saussure. The former meaning analysis of the structure of language, the latter analysis of the evolution of language. Their methodological potential made them transgress the boundaries of linguistics and resulted in them being used at present in the epistemology of a great number of sciences.
In the context of this methodological framework, the *synchronic analysis* focuses on the state of the object at a particular historical moment, whereas the *diachronic analysis* allows us to focus on changes over time. The third term, strictly connected with the previous two, is *panchrony*. Oleg Leszczak[1] calls it *a cognitive state* - such as, for instance, knowledge. Panchrony is the concept that allows us to declare that an object retains its identity despite changes.
Using the above notions, the evolution of a given object can be described as a chain of successive transformations (changes) and states (periods of stability) – the latter being consequences of the former. Transformation is seen as the diachronic function, subsequent states are seen as synchronic beings which retain the object's identity thanks to knowledge, intuition and experience - the panchronic level.

The *diachrograms*' role is to recap visually the lifeline of an architectural object as reported by a particular analyst, that is, with regards to one and only one interpretation and understanding of the historical evidence. They show successive changes of an object, with detailed consideration of the type, character and effects of particular transformations. They operate like a classic timeline – distance represents time with a given time granularity. Events are positioned in time, and the relative proportion of durations of particular states and transformations is retained. This naturally implies being able to define, then position and quantify in time each and every change, and this univocally.
When analysing the evolution of an architectural object, there may be periods in the object's lifeline for which that level of constraint is out of reach. The main weak point of the diachrograms formalism lies there: the necessity to choose one and only "path of evolution". The reality may look different - the analyst sometimes does not have enough data to exclude alternative possibilities, and accordingly may need and want to retain them.
Privileging this or that interpretation in order to end up with one unique storyline also has an indirect consequence: it pushes the analyst into micro information spaces. The object is isolated from possible alternative causal relations, its storyline is marked by hidden choices that are made, and are relevant, only in the context of this object. The framework requires a good analysis of the artefacts before making any sense, implies to thoroughly describe the evidence (including by uncertainty "measurement") and therefore is of little support in the early phases of investigations.

[1] *cf*. O. Leszczak, *Problem czasu w semiotyce: idiosynchronia - diachronia – panchronia.* (*The problem of time in semiotics: idiosynchrony - diachrony - panchrony,* [in] *The Peculiarity of Man*, vol. 9, Warszawa-Kielce, 2003, pp. 301-330

However, the framework meets two principles for the analysis and presentation of data quoted by (Tufte, 2006): *show causality, mechanism, explanation, systematic structure and integrate evidence*.

The first methodological framework proposed in 2008[2] identified seven transitions and states occurring within a life cycle (abandon, decay, annexation, demolition, modification, secession and segmental anaesthesia), as well as 8 transitions and states starting or ending a life cycle (creation, extinction, hibernation, internment, merge, reincarnation, split and translocation). Tags used to denote these transitions and states have been chosen as illustrative enough to let the reader grab their semantics.

The "diachrogram" formalism has been questioned and extended since then, through a series of real cases encompassing a wide range of architectural settings (from urban civil and religious architecture to isolated, poorly documented rural chapels) . This document is a preliminary compilation of changes in the model itself, and consequences on the visual formalisms that are attached to it.
It comprises definitions of the concepts behind the approach, definition of the presentation grid, and tables that include a detailed definition of each state and/or transformation, along with the corresponding glyphs ("visual language").

The role of this document is to present the method in a more in-depth way than what could be done previously through classic publications, to update it with recent research results, and to facilitate its cross-examination in the scientific community.

I. Dudek, J.Y Blaise

[2] Iwona Dudek, Jean-Yves Blaise. UNDERSTANDING CHANGES IN HERITAGE ARCHITECTURE: Can we provide tools & methods for visual reasoning?. *IMAGAPP/IVAPP (International Conference on Information Visualization Theroy and Applications) 2010*, May 2010, Angers, France. pp.91-100, ⟨10.978.989.674.027.6⟩. ⟨halshs-00564156⟩
Iwona Dudek, Jean-Yves Blaise. Visual assessment of heritage architecture life cycles. I-Know 2007, I-Know I-Media 08, 8*th International Conference on Knowledge Management, Sep 2008*, Graz, Austria. pp.349-357. halshs-00325865)

	<transformation>				[state]		_life cycle_	
name	**coverage** global partial	**qualification** opening altering transmigrating terminating closing	**duration** short-term long-lasting	**dependence** independent corollary resulting	**activity status** active inactive	**visibility status** overground concealed	**legacy** primal cycle secondary cycle	**complexity** uniform compound
hibernation	-	-	-	-	**inactive**	**concealed**	**secondary cycle**	**uniform**
segmental anaesthesia	-	-	-	-	**inactive**	overground concealed	primal and secondary cycle	**compound**
split	**global**	opening **terminating** closing	short-term long-lasting	**independent**	-	-	primal and secondary cycle	uniform compound
secession	**partial**	opening **altering**	short-term long-lasting	**independent**	-	-	primal and secondary cycle	uniform compound
creation	**global**	**opening**	short-term long-lasting	independent corollary resulting	-	-	**primal cycle**	uniform compound
abandon	**global**	**altering**	short-term long-lasting	**independent**	inactive	**overground**	primal and secondary cycle	**uniform**
decay	**global**	**altering**	short-term long-lasting	independent resulting	**inactive**	**overground**	primal and secondary cycle	**uniform**
destruction	global partial	altering terminating transmigrating	short-term long-lasting	**independent**	-	-	primal and secondary cycle	uniform compound
extinction	**global**	**closing**	short-term long-lasting	**independent**	-	-	-	-
reincarnation	global partial	**terminating** **transmigrating**	short-term long-lasting	independent resulting	-	-	**secondary cycle**	uniform compound
modification	global partial	**altering**	short-term long-lasting	**independent**	-	-	primal and secondary cycle	uniform compound
merge	**global**	**opening** **transmigrating** **closing**	short-term long-lasting	**independent**	-	-	**primal cycle**	uniform compound
annexation	global partial	altering closing	short-term long-lasting	**independent**	-	-	primal and secondary cycle	uniform compound
interment	**global**	altering terminating transmigrating	short-term long-lasting	**independent**	-	-	primal and secondary cycle	**uniform**
translocation	global partial	altering terminating transmigrating	short-term long-lasting	**independent**	-	-	**primal cycle**	uniform compound
move and swap	**global**	**terminating** **transmigrating**	short-term long-lasting	**resulting**	-	-	**secondary cycle**	**uniform**
enclosure	**global**	**altering**	short-term long-lasting	**independent**	-	-	primal and secondary cycle	uniform compound
vestige	-	_	-	-	**inactive**	**overground**	primal and secondary cycle	uniform compound

Proprieties represented in bold (e.g., **global**) are true for every transformation, state, or life cycle of the given type.

➜	properties of transformations <>		transformation transformacja
coverage étendue zasięg	<glo>	**global** globale t. globalna	A transformation that concerns an entire artefact (a core object and a segment if present).
	<par>	**partial** partielle t. fragmentaryczna	A transformation that involves only a fragment of an artefact.
qualification qualification właściwości	<open>	**opening** ouvrante t. otwierająca	A transformation that marks the beginning of an artefact's evolution.
	<alt>	**altering** altérante t. modyfikująca	A transformation that modifies an artefact or its portion inside its current cycle of life.
	<ter>	**terminating** terminant un cycle t. kończąca cykl	A transformation that marks the end of the current cycle of life.
	<clos>	**closing** terminale t. zamykająca	A transformation that marks the end of the last cycle of life, and therefore the whole evolution of an artefact.
	<trans>	**transmigrating** transmigration t. otwierająca nowy cykl	A global transformation that marks the beginning of a new cycle of life inside the evolution of the artefact.
duration durée czas trwania	<short>	**short-term** brève t. krótkotrwała	A transformation that occurred in a relatively short period with respect to the time granulation adopted in the analysis. A duration of a short-term transformation is smaller or equal to one *chronon*, therefore the qualification of a duration of a transformation depends on a time granulation adopted in the analysis. In our analyses we have adopted one-year chronon, consequently a short-term transformation is one that lasts one year or less.
	<last>	**long-lasting** longue t. długotrwała	A long-winded transformation. Its duration is longer than one *chronon*. A qualification of duration of a transformation depends on time granulation adopted in the analysis.
dependence dépendance zależności	<ind>	**independent** autonome t. niezależna	A transformation that does not require any other preceding transformation to take place, although it may occur along with another transformation.
	<cor>	**corollary** corollaire t. ściśle powiązana	A transformation that is a natural and unavoidable consequence of the preceding transformation.
	<res>	**resulting** résultante t. będąca skutkiem	A transformation that may occur as a consequence of the preceding transformation. The occurrence of the resulting transformation is facultative and aleatory.

O	properties of states []			état stan
activity status statut d'activité stan aktywności	[act]	**active** actif s. aktywny	A condition in which an artefact or its portion performs - at least partially - its usual role (*e.g.*, the building is in use).	
	[ina]	**inactive** inactif s. nieaktywny	A condition in which an artefact or its portion does not perform at all its usual role (*e.g.*, no functional activity).	
visibility status visibilité widoczność	[app]	**overground** émergé nadziemny	A condition in which an artefact contains overground elements.	
	[con]	**concealed** immergé podziemny	A condition in which an artefact is entirely composed from underground elements.	

C	properties of life cycles _ _			cycle de vie cykl życiowy
legacy succession następstwo	_p_	**primal cycle** initial pierwotny cykl	The initial, original cycle of life.	red colour of the state bar
	_s_	**secondary cycle** cycle secondaire cykl wtórny	Any succeeding, subsequent cycle of life (not the initial one).	grey colour of the state bar for hibernation, orange for reincarnation, etc.
complexity complexité stopień złożoności	_u_	**uniform** uniforme jednorodny cykl	A cycle of life in which an artefact is regarded as one undivided element.	
	_c_	**compound** composé cykl złożony	A cycle of life in which an artefact is regarded as composed from portions (a core object and segment(s)).	

other notions

ω	**artefact** artefact obiekt	An entire artefact or an ensemble considered as one basic entity. An artefact may be subdivided into portions (core object and segment(s)).
α, φ	**portion** partie część	A subset of an artefact resulting from a conceptual division of the artefact into active and inactive parts.
α	**core object** objet noyau część podstawowa	A portion of an artefact encompassing its active elements, may they be overground or underground structures.
φ	**segment** segment segment	An inactive portion of an artefact, may it be overground or underground structure.
	functional activity activité fonctionnelle aktywność funkcjonalna	A condition in which an artefact performs its functional role.
$\Sigma(\omega_n - \omega_{n+1})$	**cycle of life** cycle de vie cykl życiowy	An artefact's life cycle identifies a time slot corresponding to a fragment of its evolution. A shift between two cycles of life occurs each time an artefact enters entirely into a concealed and inactive state, or when it comes out from it (entirely or partially).
$<t>\omega_n \rightarrow \omega_{n+1}$	**transformation** transformation transformacja	A process during which an artefact changes. The alteration may concern an entire artefact (*e.g.*, an overall renovation), or be limited to its fragment (*e.g.*, a fire of a roof).
ω_n	**state** état stan	A period in the existence of an artefact during which its features remain constant (in the same condition, not changing).
$\Sigma(\omega_0 - \omega_{max})$	**evolution of artefact** évolution de l'artefact ewolucja obiektu	The process of gradual development of an artefact over its whole life span, from its creation until its extinction (*i.e.*, its thorough and irreversible physical removal).

transformation
state

name (en)
name (fr), **name (pl)**

< > < >
[] []
— — — —

general information

<transformation>
definition

[state]
definition

Exemplification of the presented notion by fragments of diachrogrammes.

	<transformation>	[state]
short-term	symbols used	symbols used
long-lasting	symbols used	

hibernation

hibernation, **hibernacja**

[ina] [con]
_s_ _u_

Hibernation appears as a result of a total disappearance of an artefact's overground parts (if they ever existed*) combined with a cessation of any functional activity inside the remaining inaccessible and concealed part.

An artefact may be considered as "*hibernating*" if, and only if its entire structure is covered by ground and all its functional activities ceased. One can talk about a •*hibernation* only in case of underground structures.

Structures that are permanently flooded, but are not buried under ground are not hibernating. According to their state, they may be considered as abandoned (*cf.* •abandon), or decaying *(cf.* •*decay)*.

[state]

A •*hibernation* is an **inactive** and **concealed** state of an entire artefact.

A transformation that leads to the state of *hibernation* is always a **global**, **terminating** and **transmigrating** one, therefore the state of *hibernation* always appears in a **secondary** and **uniform** cycle of life.

An overground artefact may enter into a •*hibernation* after a →*destruction* (e.g., dismantling Fig. a-d, f-i, earthquake Fig. e). An active and concealed artefact may enter into a •*hibernation* through a →*modification* (combined with cessation of functional activity). Yet these transformations do not always lead to a •*hibernation*.

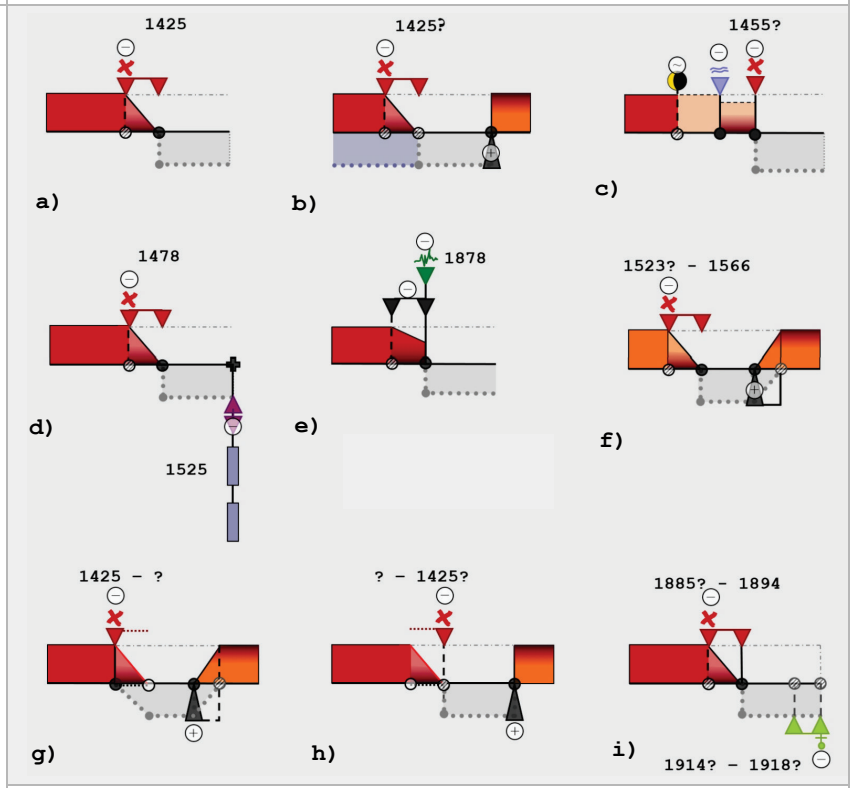
Entering into the state of *hibernation* may be a result of a **short-term** transformation (see Fig. a-e), or of a **long-lasting** transformation (see Fig. f-i).

An artefact may come out of the state of hibernation only through the reincarnation transformation (see Fig. b, f-h) (*cf.* →*reincarnation*). It reappears then in a subsequent secondary cycle of life.

A sporadic, occasional activity inside a hibernating artefact is possible – an archaeological intervention for example. Such an incident does not interrupt the •*hibernation* of the artefact, yet the results of such intervention may close it (*e.g.*, an adaptation and reuse of a hibernating artefact bring to the end the state of hibernation).

Do not confuse •*hibernation* with •*buried vestige* or •*interment*.

* An underground structure may enter into the state of hibernation after a definite obstruction of all entrances to the artefact.



[state]

segmental anaesthesia

anesthésie partielle, segmentowe uśpienie

[ina] [con] [app]
_p_ _s_ **_c_**

Segmental anaesthesia concerns a portion of an artefact. It manifests itself through a complete loss of functional activity inside a segment that goes with a dissolution of all functional connexions that the segment could have with the remaining object.

A portion of an artefact may be considered as an "*anaesthetised segment*" if, and only if it becomes inaccessible from the core object and its own functional activity is reduced to zero.
We are talking about a •*segmental anaesthesia* generally in the case of underground structures (*e.g.*, a basement). However, this state may also appear in case of overground structures.

A sporadic activity inside an anesthetised segment is possible – an archaeological intervention for example. It does not interrupt the state of segmental anaesthesia of the segment.

[state]

An anaesthetised segment is a segment in an **inactive** and most often **concealed** state. It occurs as a consequence of a partial transformation and concerns only a portion of an artefact.

Like •*hibernation*, this state may emerge as a result of a **short-term** event (see Fig. a-c, h), or of a **long-lasting** process (see Fig. d-g, i).

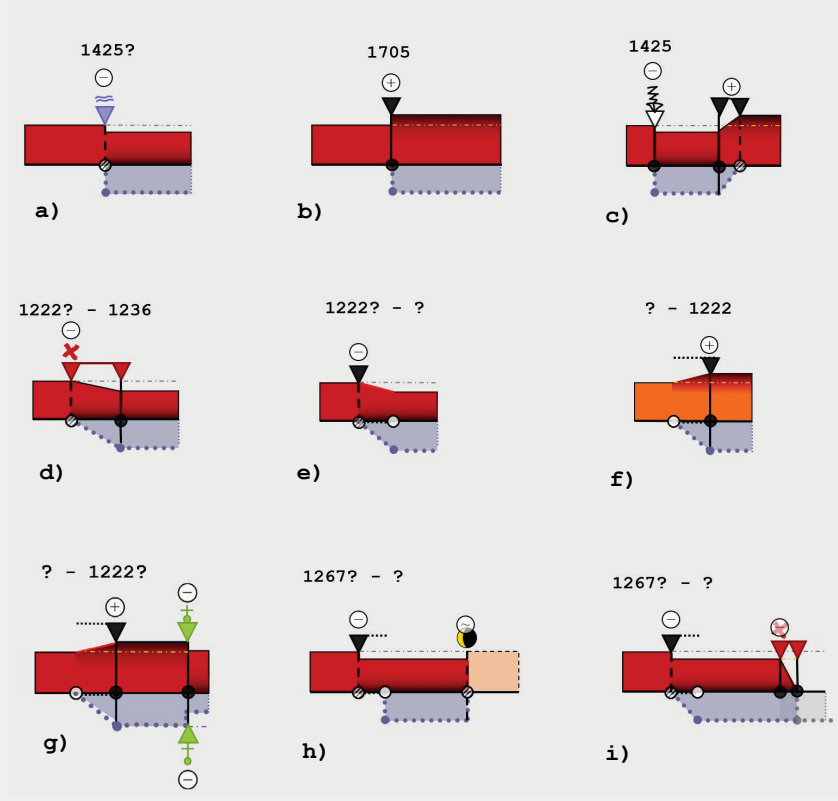
A transformation that leads to a •*segmental anaesthesia* is always a **partial** transformation therefore a state of *segmental anaesthesia* always leads to a **compound** cycle of life without starting a new cycle.

A •*segmental anaesthesia* may emerge in a **primal** or a **secondary** cycle of life.

An anaesthetised segment may come back into an active state thanks to a →*modification*. The segment simply re-joins the core object (see Fig. c). Coming out from the state of segmental anaesthesia may be a **short-term** transformation, but most frequently it is a **long-lasting** process.

An →*abandon* of the core object marks automatically the end of the •*segmental anaesthesia* of its segment(s) – in this case, segment(s) under consideration re-joins the core object in an inactive state (see Fig. h). A similar effect may result from a combination of some others transformations (*e.g.*, →*destruction* leading to →*decay*).

When the segmental anaesthesia concerns underground structures, a →*destruction* of the totality of a core object (as a global transformation) transforms a state of concerned segment(s) from the state of *segmental anaesthesia* into the state of *hibernation* (see Fig. i).



[state]

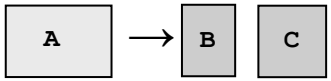
split

fragmentation, **podział**

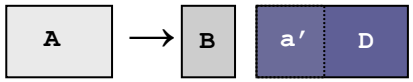
<glo> **<ter>** <open> <clos> **<ind>** <short> <last>

_p_ _s_ _u_ _c_

Split is a formal division of an **entire artefact** into parts considered as unrelated to the original artefact.



In the majority of cases split leads to the creation of independent artefacts (B,C,…). Fragment(s) resulting from a →*split*, may however never appear as an independent artefact (*e.g.*, a fragment (a') resulting from →*spilt* of (A) may be →*annexed* by an artefact (D) in the moment of a →*split*, and therefore will not appear as an independent artefact).



<transformation>

Split is a **global** transformation - it always affects an entire artefact.

It is always a **terminating** and never a **transmigrating** transformation. It terminates the current cycle of life of an artefact generally starting new primal cycles inside the evolution of the resulting objects. In those cases, it is an **opening** transformation.

With some exceptions (see Fig. g, h – resulting objects re-united after some time), a →*split* acts also as a **closing** transformation (see Fig. a-f, i).

The most common consequence of a →*split* is a →*creation*. In those cases, a →*creation* will be a resulting transformation.

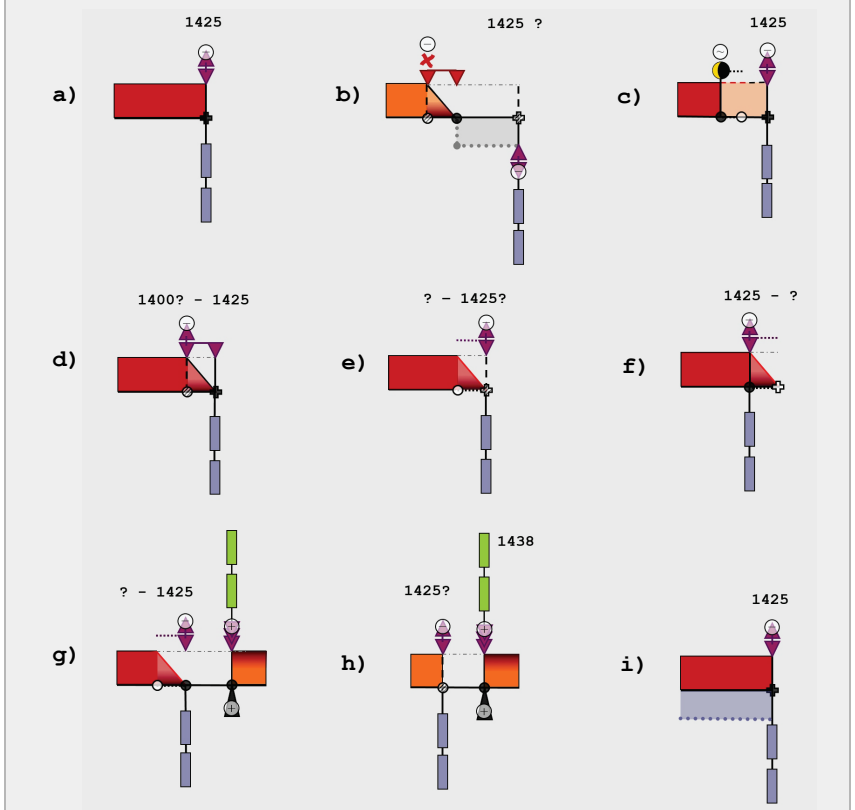
A →*split*, does not require any other transformation to take place, it is therefore an **independent** transformation. It is often a result of a property's division.

→*Split* may be a **short-term** (see Fig. a-c, h, i) or a **long-lasting** transformation (see Fig. d-g).

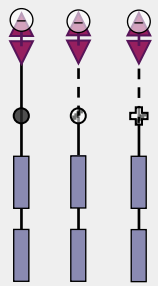
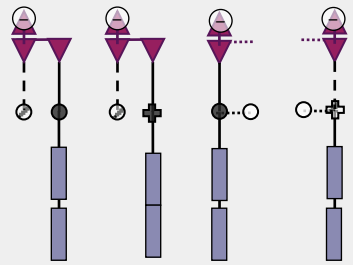
An artefact can split into portions that may be in an **active** (see Fig. a, d-h), or an **inactive** state (see Fig. b, c), containing **overground** (see Fig. a, c-f) or **concealed** portions (see Fig. b), in a **uniform** or a **compound** cycle of life.

A →*Merge* combined with a →*reincarnation* constitute a reversing transformation for a →*split* (see Fig. g-h). In this case, an artefact may reappear in a secondary, uniform cycle of life.

Do not confuse →*split* with →*secession*, or →*translocation* of a fragment of an artefact.



<transformation>

short-term	long-lasting
	

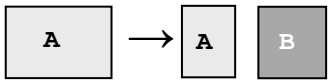
secession

sécession, secesja

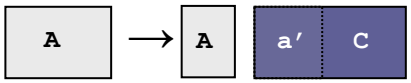
<par> <alt> <open> <ind> <short> <last>

_p_ _s_ _u_ _c_

Secession is a process of formal division and separation **of a portion** from an artefact (A). This transformation usually initiates the →*creation* of an independent artefact (B), or artefacts(s).



A portion (a') detached from an artefact (A) through a →*secession*, may be annexed (*cf.* →*annexation* by an artefact (C) in the moment of the secession, and therefore never appear as an independent artefact.



<transformation>

Secession is a **partial** transformation – it always affects a portion of an artefact.

It is always an **altering** transformation, and with some exception of annexed portions, it is an **opening** transformation, as far as the portion is concerned. It modifies the original artefact inside one cycle of life (see Fig. a-i) and usually brings to life one or more new, independent objects.

A →secession never acts as a closing transformation.

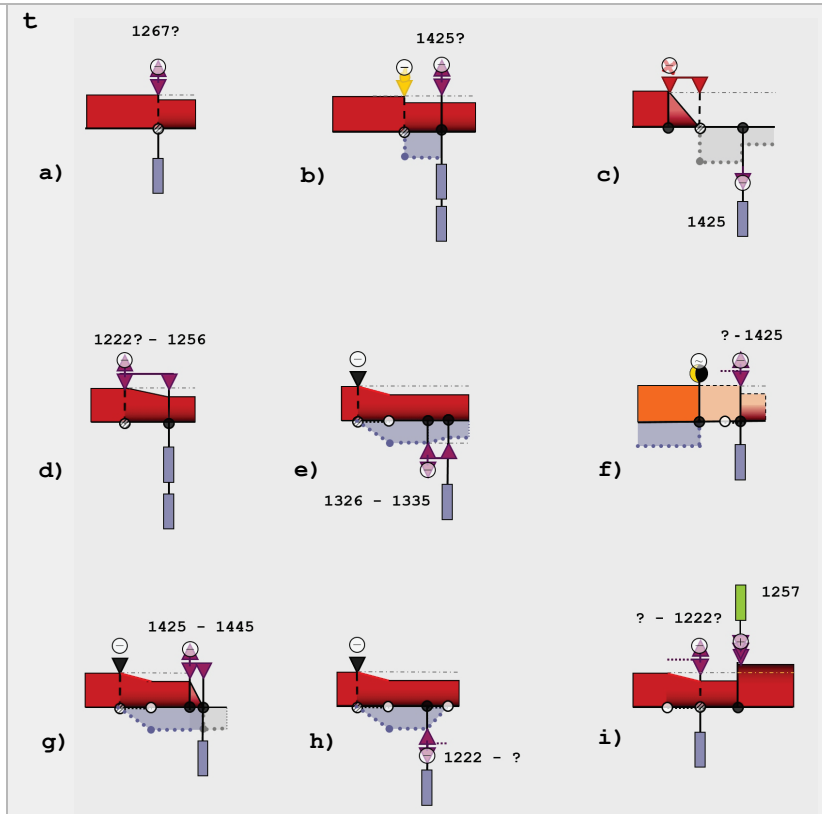
Like a →*split* it does not require any other transformation to take place, it is therefore an **independent** transformation. It is often a result of a property's division.

A →secession may be a **short-term** event (see Fig. a-c) or a **long-lasting** process (see Fig. d-i).

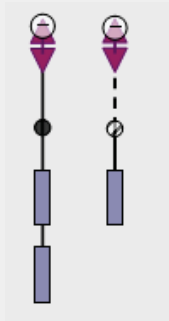
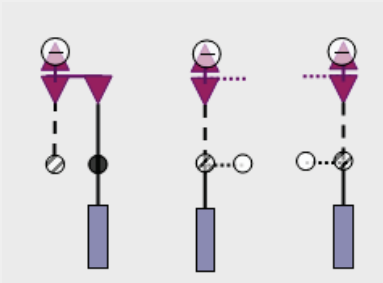
It may affect objects in any state: **active** (see Fig. a and d), **inactive** (see Fig. c, e), **overground** or **concealed** (see Fig. c), although it is more frequent for objects in an active and overground state.

An →*annexation* may act as a transformation that reverses the result of a →*secession*.

Do not confuse →*secession* with →*split*, or →*translocation* of a fragment of an artefact.



<transformation>

short-term	long-lasting
	

creation

création, **kreacja** (*powstanie*)

<glob> **<open>** <ind> <res> <cor> <short> <last>

_p_ _u_ _c_

Creation is the act of bringing an artefact into existence.

<transformation>

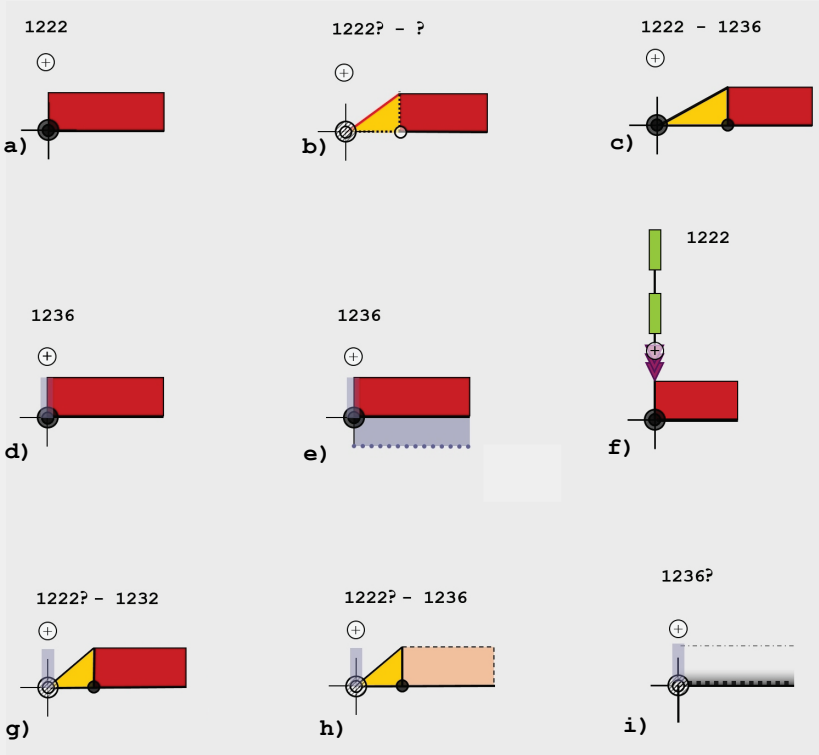
Creation is a **global**, **opening** transformation. It is a starting transformation in an evolution of an artefact. It initialises an artefact in its **primal** cycle of life.

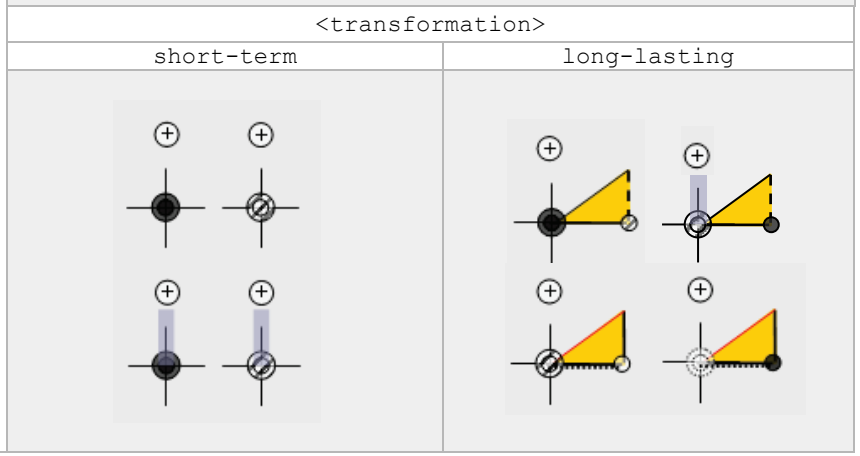
It may be an **independent** transformation (see Fig. a-c), or occur as a **resulting** transformation (*e.g.*, →*split*, →*secession* (see Fig. d, e and g-i) or →*merge* (see Fig. f). In the second case, →*creation* results an identity given to the portion(s) separated from the original artefact.

In case of a →*split* or a →*secession*, a →*creation* is not a corollary transformation, however it is a **corollary** transformation of →*merge* (see Fig. f).

→*Creation* may be a **short-term** event (see Fig. a, d, e, f and i) or a **long-lasting** process (see Fig. b, c, g and h).

→*Creation* may result in bringing to existence an artefact in any state: **active** (see Fig. a-g), **inactive** (see Fig. e, h and i), **overground** or **concealed**, in a **uniform** (see Fig. a-d, and f-i) or a **compound** (see Fig. e) cycle of life.





abandon/abandonment

abandon, opuszczenie

<glo> <alt> <ind> <short> <last>
[ina] [app]
_p_ _s_ _u_

Abandon is a result or a process of withdrawing all human presence and activity from an entire artefact, when the object is still in an overground state.

An artefact may be considered as "abandoned" if, and only if it is an overground structure that became inactive due to a total standstill of its functional activity. A sporadic, occasional activity inside an abandoned segment (*e.g.*, a photographical survey) is possible without changing the state of the artefact to an active one.

<transformation>

Abandon is a **global** and **altering** transformation. It affects always an entire artefact, transforming its state inside the current cycle of life – a **primal** cycle (see Fig. a-e, g-i) or a **secondary** one (see Fig. f).
A result of abandon is always an **inactive** artefact in a **uniform** cycle of life.

This transformation may be a **short-term** event (see Fig. a, b, d, f and g) or a **long-lasting** process (see Fig. c, e, h and i).

→*Abandon* does not require any other transformation to take place, is an **independent** transformation.

If an artefact is in a compound cycle of life (*i.e.*, it is composed of an active core object and inactive segment(s)) and its core object becomes abandoned, all inactive segments re-join automatically the core object in its current cycle of life (see Fig. b and f). In other words, →*abandon* transformation terminates a state of •*segmental anaesthesia or* •*hibernation*.

A →*modification* may act as a transformation that reverses the results of →*abandon*. (see Fig. h)

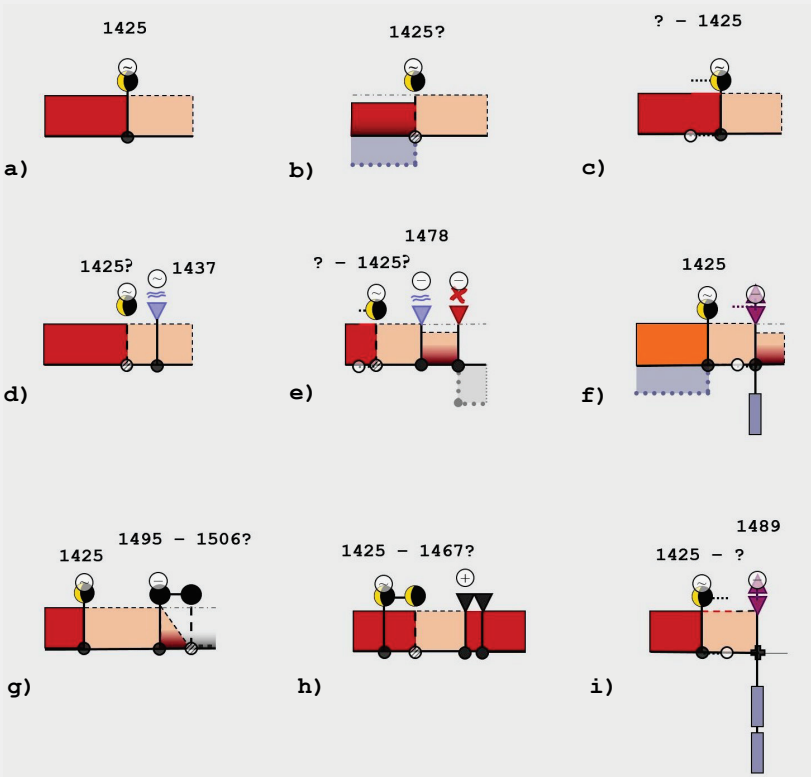
[state]

An abandoned artefact is always in an **inactive** state in a **uniform** cycle of life.

The core object necessarily contains **overground** parts otherwise we should talk about a state of •*hibernation* or •*interment*.

As already mentioned, a →*modification* may lead an artefact out from a state of •*abandonment* and allows it to return to an active state (see Fig. h).

Do not confuse →abandon, or •abandonment with a →/•*decay*.



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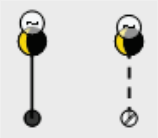
short-term		
long-lasting		

decay

agonie, **agonia**

<glo> **<alt>** <ind> <res> <short> <last>
[ina] **[app]**
_p_ _s_ **_u_**

Decay is a process of gradual degradation of an artefact, frequently leading to its →*destruction* or •*hibernation*. The state of decay is a possible consequence of a long-term abandon of an artefact, or a destruction (related to environmental causes or human activity).

An artefact may be considered as "*in decay*" if, and only if it is in an **inactive** state, and contains **overground** structures without a roofing. In case of edifices, a decay starts with a breakdown of its protection – its roof. The decay transformation starts when the first part of the artefact's roof goes down, and ends when it collapses definitively. The state of decay tan begins.

The state of decay should not be confused with the state of vestige (*cf.* •*vestige*).

<transformation>

Decay is a **global** and **altering** transformation. It affects always an entire artefact, transforming it inside its current cycle of life (**primal** or **secondary**).

A result of a →*decay* is always an artefact in a **uniform** cycle of life.

This transformation may be a **short-term** event (see Fig. a, b and h) or **long-lasting** process (see Fig. c-g and i).

A →*decay* is not a corollary transformation. It may be an **independent** transformation (see Fig. a, c, e-g and i), or a **resulting** transformation – when a state of *decay* occurs as a consequence of other transformation a →*destruction* for example (see Fig. b, d and h).

A →*decay* never acts as a closing transformation.

A →*modification* may act as a reversing transformation for a →*decay* (see Fig. e).

[state]

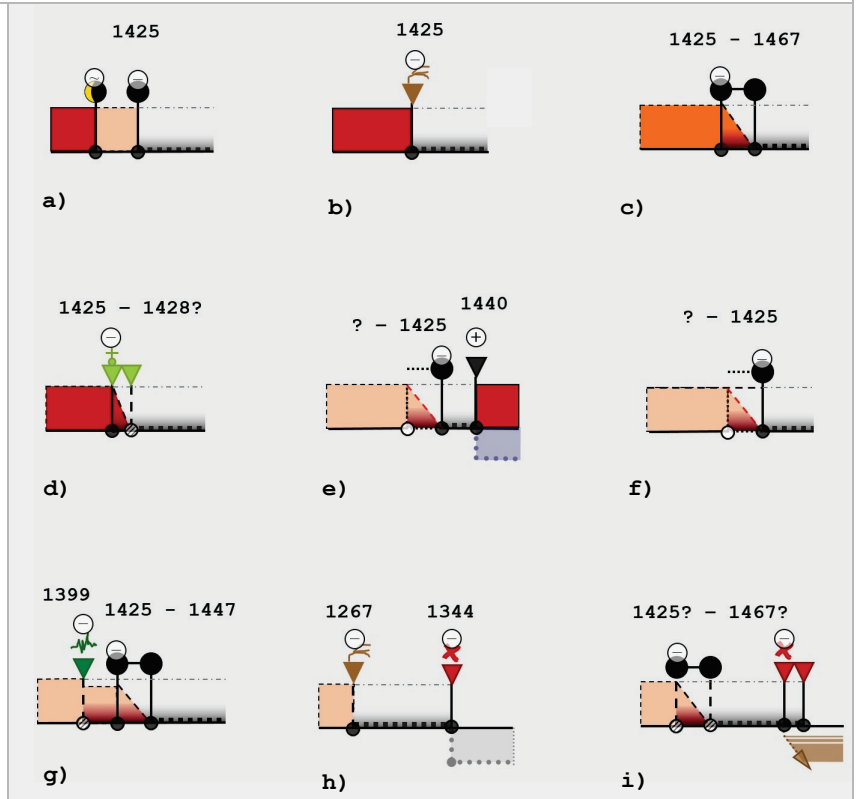
An artefact in *decay* necessarily contains **overground structures** deprived of a roofing, and it is always an element of a **uniform** cycle of life in an **inactive** state.

A •*decay* may appear in a **primary** (see Fig. a, b, d and e) or in a **secondary** (see Fig. c) life cycle.

An artefact may enter into a state of •*decay* without a →*decay* transformation (*e.g.*, after a hurricane, during a war, *etc. cf.* →*destruction*) (see Fig. b, d and h).

If all of its overground parts disappear, an artefact in •*decay* may enter into a •*hibernation* (see Fig. h) or be a subject of an •*interment* (see Fig. i).

A →*modification* may lead an artefact out of a •*decay* (*e.g.*, a revitalisation and adaptation of ruins into a museum) (see Fig. e).



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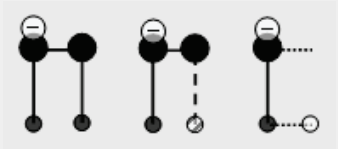
long-lasting		

destruction

démolition, **zniszczenie**

Destruction is a damaging incident the consequences of which are opposite to those of a construction. The damages brought on an artefact may be related to environmental causes or human activity.

<transformation>

A →*destruction* may be a **partial**, or a **global** transformation – it may concern an entire artefact or its portion.

Its results vary from a fractional damage (see Fig. c, d-h) to a complete disappearance of overground parts (see Fig. a, b and i). It may therefore act as an **altering** transformation (the first case) or **terminating** and **transmigrating** transformation (the second case).

It is an **independent** transformation.

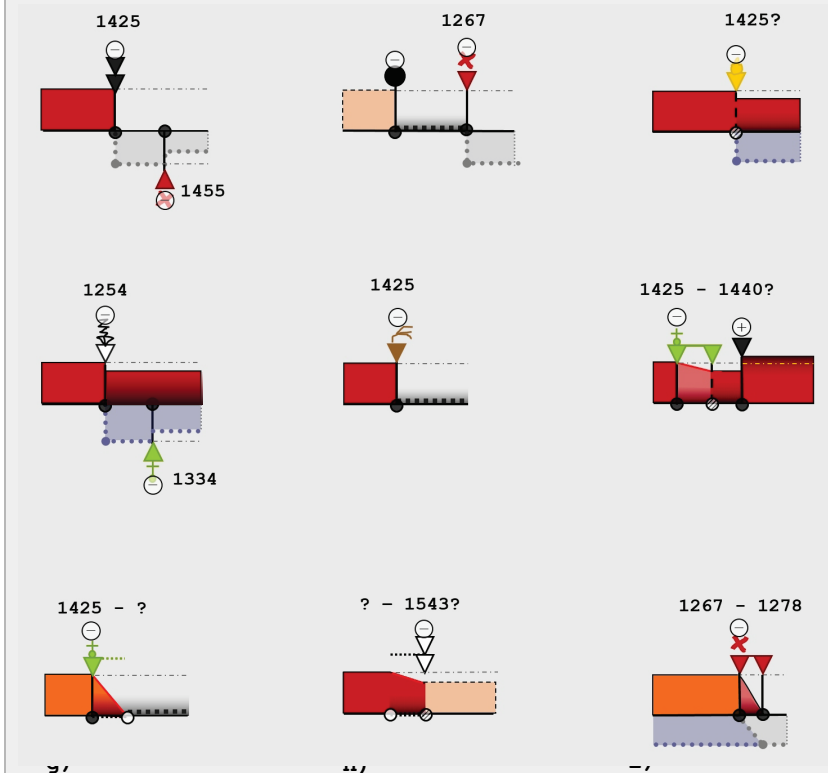
A →*destruction* may also affect concealed parts of objects (see Fig. a, d), but it never carries degradation effects to a point of total annihilation of an artefact (*cf.* →*extinction*), therefore it never acts as a closing transformation.

Probably because of its damaging character and possible independence from human will and initiative, a →*destruction* may occur in any state of an artefact: **active** (see a, c, d-i), **inactive** (see Fig. a, b and d), **concealed** (see Fig. a and d), **overground** (see Fig. a-i)), and in any cycle of life: **uniform** (see Fig. a-h), **compound** (see Fig. d and i), **primary** (see Fig. a-f and h) or **secondary** one (see Fig. g and i)). Correspondingly, the results of →*destruction* may appear in each cycle of life and in every state.

A →*destruction* may be a **short-term** event (see Fig. a-e), as well as a **long-lasting** process (see Fig. f-i).

It may be a direct cause leading to a state of a •*hibernation* (see Fig. a, b and i), a •*decay* (see Fig. e and g), an •*abandon* (see Fig. h), *etc.*

A transformation that may potentially reverse the results of a →*destruction* is a →*modification* (see Fig. f).



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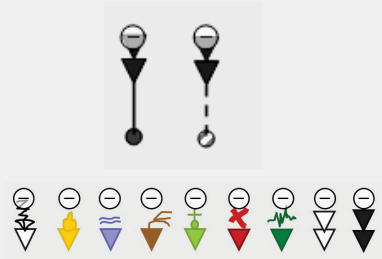
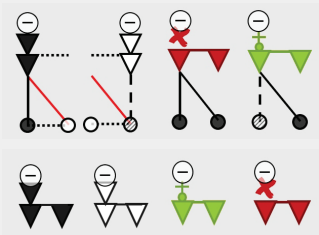
short-term	long-lasting
	

extinction

extinction, **unicestwienie**

<glo> **<clos>** **<ind>** <short> <last>

_p_ _s_ _u_ _c_

Extinction is an act of destruction that brings a global damage to an artefact. The result of an extinction is the total annihilation of the artefact.

<transformation>

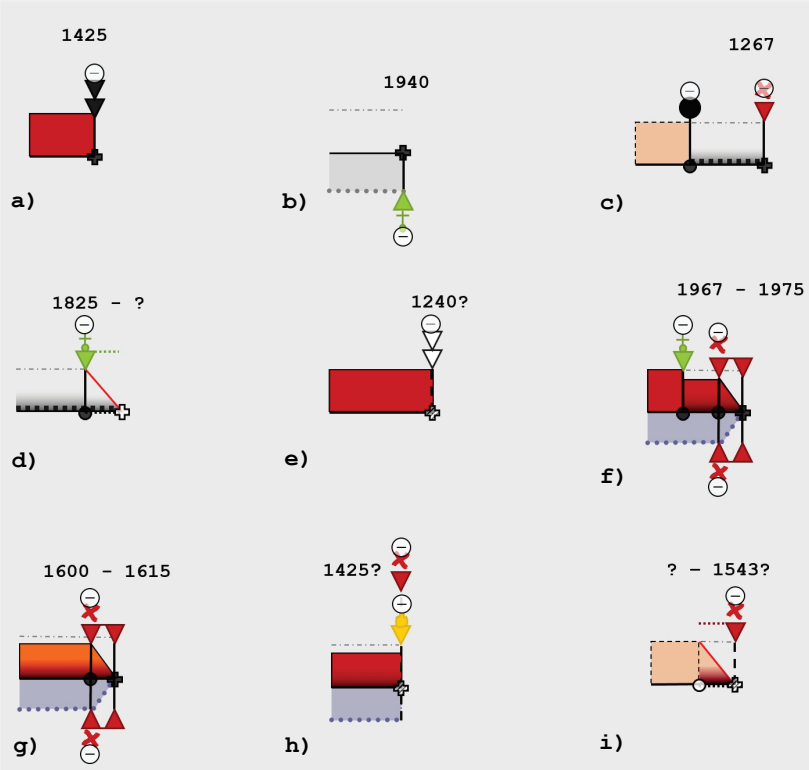
An →*extinction* is a **global** transformation – it always implies an entire artefact, both its overground and concealed parts.

It is a **closing** and an **independent** transformation. It marks definitively the end of the artefact's current cycle and of its whole evolution.

An →*extinction* (like a →*destruction)* - may occur in any state of an artefact: **active** (see a, e, f-h), **inactive** (see Fig. b-d), **concealed** (see Fig. b, f-h), **overground** and in any cycle of life: **uniform** (see Fig. a-e, i), **compound** (see Fig. a-h), **primary** (see Fig. a, e, f, and h) or **secondary** one (see Fig. g)).
Correspondingly, the results of →*extinction* may appear in each cycle of life and in every state.

An →*extinction* may be a **short-term** event (see Fig. a-c, e and h), as well as a **long-lasting** process (see Fig. d, f, g, and i).

A reversing transformation for an →*extinction* does not exist.



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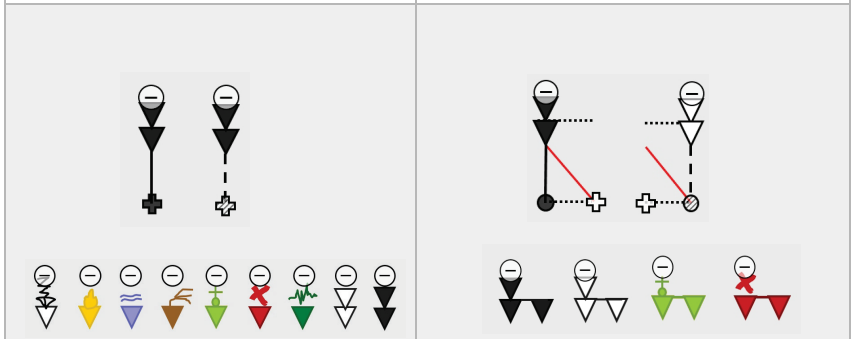
short-term	long-lasting



reincarnation

réincarnation, **reinkarnacja**

<glo> <part> **<term>** **<trans>** <ind> <res> <short> <last>

_s_ _u_ _c_

Reincarnation is an act of reappearance of an artefact in a new embodiment.

An artefact may be considered as a "*reincarnation*" if and only if it reappears in an **active** state, after a period passed in an **inactive** and **concealed** state (see Fig. b-h) or after a **phase of absence** due to a dividing (*e.g.*, →*split*) (see Fig. g) or a combining transformation (*e.g.*, →*merge*) (see Fig. i).

It is indispensable that a reincarnated artefact contains, at least partially elements of the original artefact (the 'reincarnation' of which it is supposed to be), and that newly added elements complement original ones rather than dominate them.

The *reincarnation* transformation cannot lead to the state of vestige (cf. ●*vestige*), since there is no new embodiment of the artefact, and no complementary elements added.

<transformation>

→Reincarnation concerns artefacts in an **inactive** and **concealed** state (●*hibernation*) (see Fig. b-h) or artefacts that **disappeared** and **reappeared**, due to an alternation of combining and dividing transformations (see Fig. a and i).

In the first case, →*reincarnation* is an **independent**, **terminating** and **transmigrating** transformation. It may be a **global** (see Fig. a-f, h and i) or a **partial** transformation (see Fig. g).

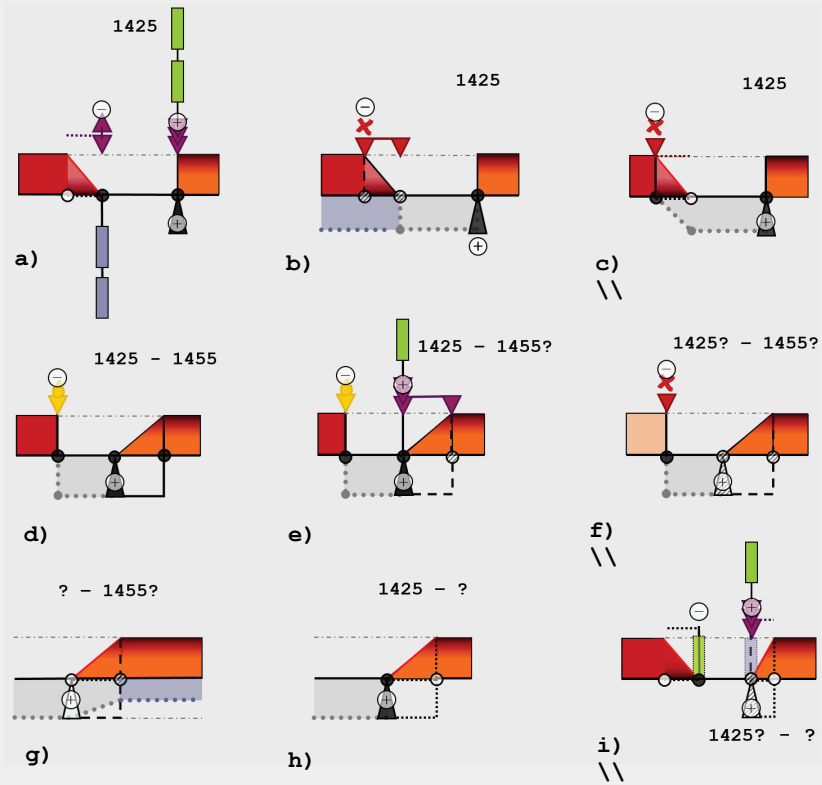
In the second case, a →*reincarnation* is a **global** and **transmigrating** transformation, always accompanied by another transformation (combining transformation (→*merge*, →*annexation*) or dividing one (→*secession*, →*split*)). It is therefore a **resulting** transformation.

In both cases, a →*reincarnation* may be a **short-term** event (see Fig. a-c) or a **long-lasting** process (see Fig. d-i).

It always occurs in an opening phase of a **secondary** cycle of life.

A →*reincarnation* may result with an artefact in a **uniform** (see Fig. a-f, h and i), or in a **compound** cycle of life (see Fig. g). It means that some portions of an artefact may not be subjects of reincarnation.

A reincarnated artefact is always in an **active** state and in a **secondary** cycle of life. It may be a **concealed** or **overground** object.



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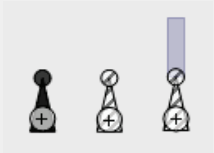
short-term	long-lasting
	

modification

modification, **modyfikacja**

Modification is an act of transforming an artefact, that results in its functional, structural or morphological alteration inside one cycle of life. Modification is in general caused by human activity (direct or indirect). It may include a partial demolition.

<transformation>

Modification is always an **altering** transformation (never a terminating or transmigrating one). It may occur in a **primal** and a **secondary** cycle of life, but it never acts as the trigger for a change of life cycle.

It may be a **global** (see Fig. g, h) or a **partial** transformation (see Fig. a-e) - it may concern an entire artefact or its portion.

A →*modification* may affect **overground** parts (see Fig. a-e, g and h), as well as **concealed** elements (see Fig. f and h), in an **active** (see Fig. a, b, d, e, g and h) or an **inactive** state (see Fig. c, f, h and i).

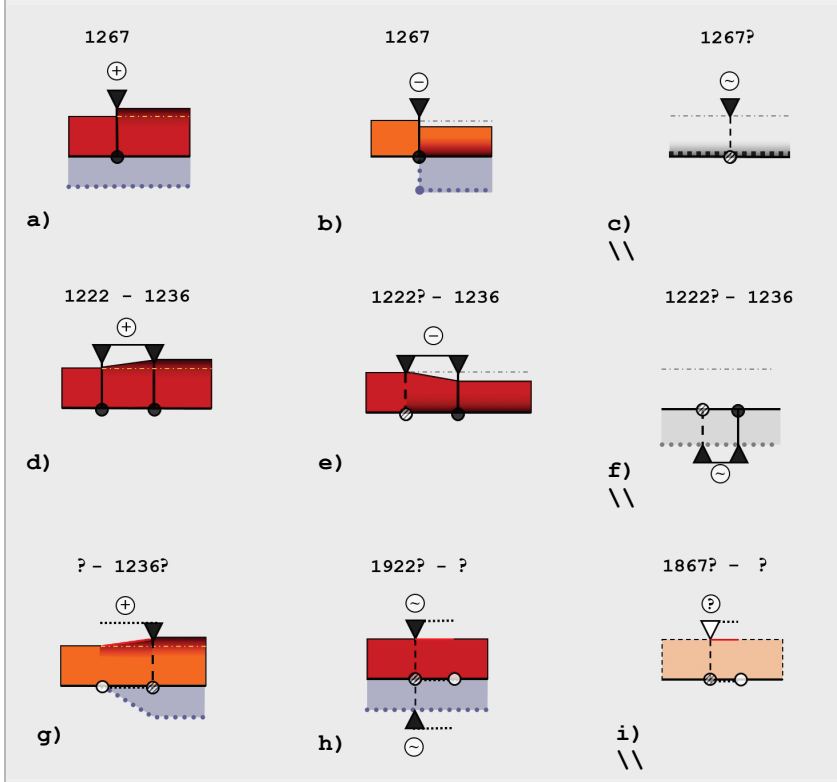
It may be a decreasing transformation (*i.e.* alteration that results with a reduction of an artefact (see Fig. b and e)), an increasing transformation (*e.g.*, an extension of an artefact (see Fig. a, d and g)) or a neutral alteration (*e.g.*, preservation - an act of maintaining an element in a constant state (see Fig. c, f and h)).

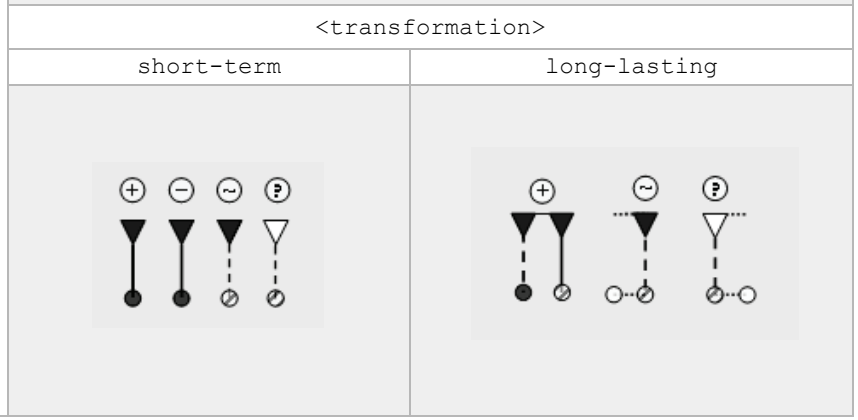
What differentiates a decreasing →*modification* from an intentional human-based degradation (→*destruction*) the underlying objective of the action - a modification is an attempt to renew, repurpose, improve the edifice, even if that implies partial destruction.

A →*modification* may be a **short-term** event (see Fig. a-c), as well as a **long-lasting** process (see Fig. d-i).

It is an **independent** transformation.

Modification is an auto-reversing transformation.





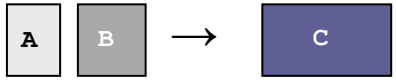
merge

fusion, **zespolenie**

<glo> <clos> <open> <trans> <ind> <short> <last>

_p_ _u_ _c_

Merge is an act of combining different artefacts (A, B) or portions of artefacts into a union, that is considered as a completely new artefact (C).



A →*creation* is a **corollary** transformation for a →*merge* – it is a natural and unavoidable consequence of a →*merge*.

<transformation>

It is a **closing** and an **opening** transformation.

For artefacts that have merged, it acts as a **closing** (but potentially reversible) transformation (see Fig. d and h), for artefact resulting from a →*merge* it is an **opening** transformation – it initialises a new artefact, starting a new **primal** cycle of life (see Fig. a-c and e-g).

An artefact initialised by a →*merge*, may appear in a **uniform** cycle of life (see Fig. a c, e and f) or in a **compound** one (see Fig. b and g).

A →*merge* may concern artefacts (or their portions) independently of their state: **active** (see Fig. a, b and d-g), **inactive** (see Fig. b, c, g and h), **overground** or **concealed**.

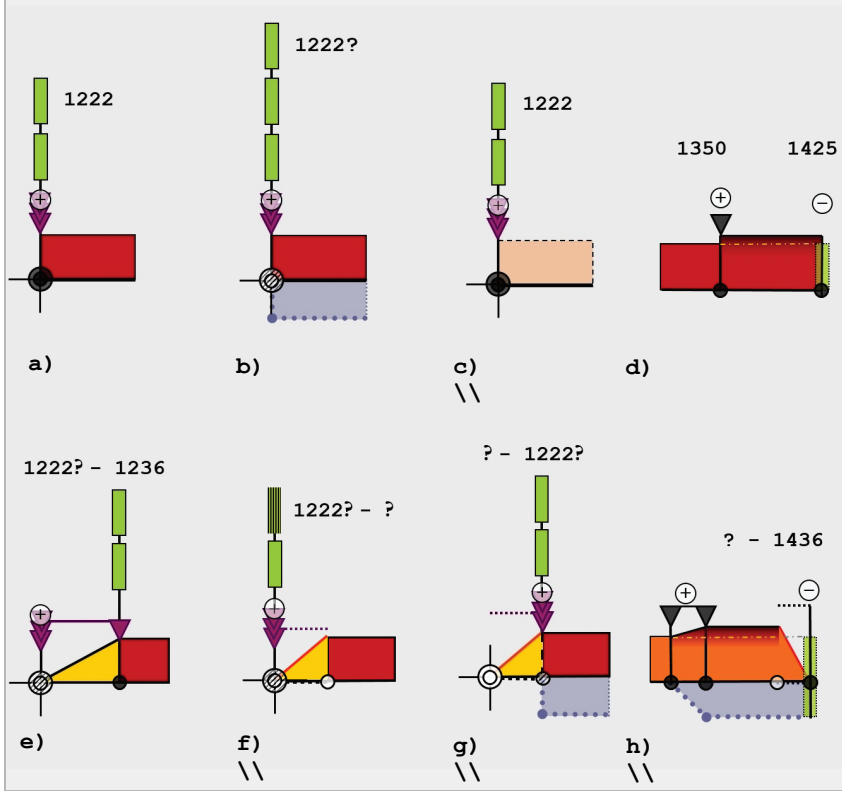
It is a **global** and an **independent** transformation often associated with property changes.

It may take the form of a **short-term** event (see Fig. a-d), as well as a **long-lasting** process (see Fig. e-h).

A →*split* is a transformation that can potentially reveres results of a →*merge*.

Together with →*split*, →*annexation*, →*secession*, →*translocation*, →*reincarnation and* →*move_and_swap*, →*merge* forms a group of **transmigrating** transformations.

Do not confuse a →*merge* with an →*annexation*.



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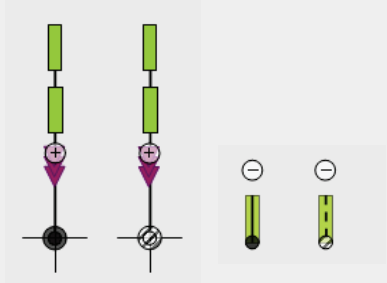
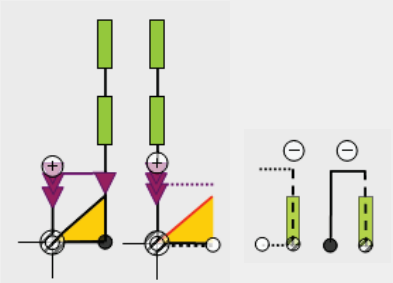
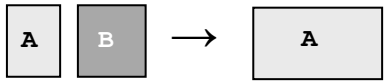
short-term	long-lasting
	

annexation

annexion, **aneksja**

Annexation is an act of combining and incorporating an entire artefact, or its portion (B) into another artefact (A), that we will call an annexing artefact. The annexed artefact (or a portion) (B) than becomes an integral part of the annexing artefact (A). Consequently, the cycle of life of an annexed element (B) comes to an end. The annexing artefact continues its life in a modified form inside its current cycle of life.



<transformation>

For an annexing artefact, an →*annexation* is always an **altering** transformation – as it modifies the artefact inside its current cycle of life (see Fig. a-c and e-h).
In this case, it is a **partial** transformation. It may concern overground parts, as well as concealed elements, in an active or inactive state, in a uniform or a compound cycle of life.
Consequently, an →*annexation* can give as a result, an artefact in a **uniform** (see Fig. a, c, f-h) or a **compound** (see Fig. b and e) cycle of life, in an **active** (see Fig. a-c and e-h), an **inactive** (see Fig. b and e), an **overground**, or a **concealed** state.

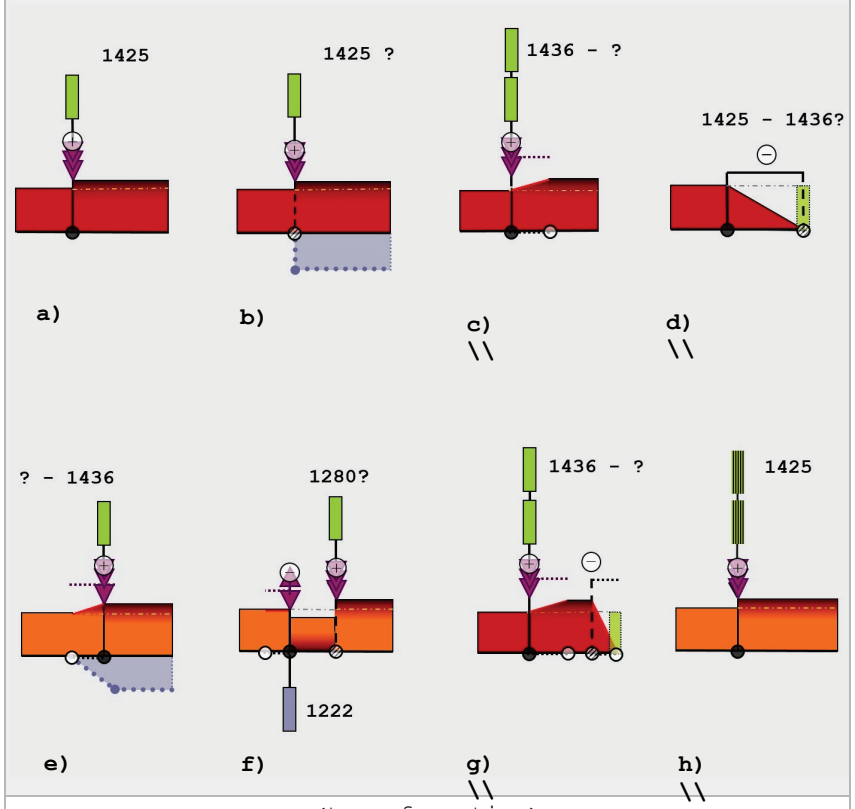
In the case of an annexed artefact, →*annexation* is a **closing** (but potentially reversible) transformation (see Fig. d, g and h).
It may be a **global** or a **partial** transformation - affecting an entire artefact or only its portion.
It may concern overground parts, as well as concealed elements, in an active or an inactive state, in both a uniform and a compound cycle of life.

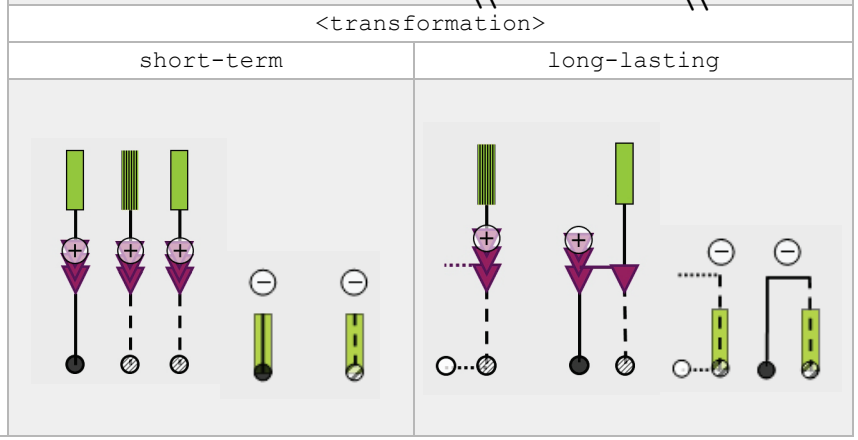
An →*annexation* may take the form of a **short-term** event (see Fig. a, b, f and h), as well as a **long-lasting** process (see Fig. c –e and g).

It is an **independent** transformation, often associated with property changes (like →*split*, →*secession* and →*merge*).

A →*secession* may reverse results of an →*annexation*.

Do not confuse an →*annexation* with a →*merge*.





interment

enterrement, **pochowanie**

<glo> <ter> <trans> <alt> **<ind>** <short> <last>
[ina] **[con]**
_p_ _s_ **_u_**

Interment is the act of placing one artefact over another in such a way, that the underlying object (interred artefact) becomes an inaccessible structure. The interred artefact (affected by interment) then becomes an inactive concealed artefact covered not only by ground but also by another structure.

Interment may be a conscious and deliberate act (*e.g.*, preventive archaeological bury), or an unintentional action (*e.g.*, construction of a building over an artefact without the knowledge of the existence of this object).

We consider an artefact as interred, if and only if the act of placing another item over it made it completely inaccessible.

<transformation>

→Interment is a **global** transformation that may occur only when an artefact got reduced to its concealed parts.

It may be a **terminating** and **transmigrating** (see Fig. a, c-f and h) or an **altering** (see Fig. b, g and i) transformation.

This transformation may be a **short-term** event (see Fig. a-e, h and i), or a **long-lasting** process (see Fig. f and g).

It is an **independent** transformation that can occur both in a **primary** (see Fig. a, c-f), or in a **secondary** (see Fig. b, g-i) life cycle of an object.

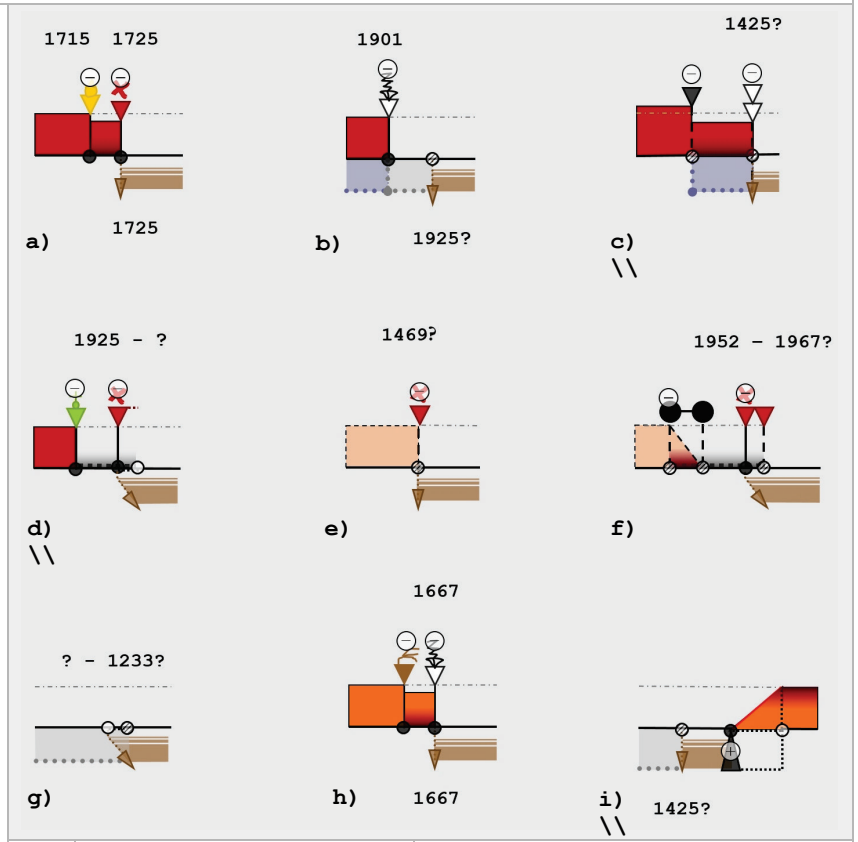
[state]

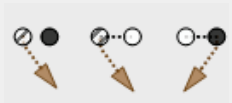
An interred artefact is an **inactive**, **concealed** object.

It is always an element of a **secondary uniform** cycle of life.

A →*demolition* of an overlaying artefact may lead to a →*reincarnation* of the interred artefact and allow to bring it back into an active state (see Fig. i).

Do not confuse an ●*interment* with a ●*hibernation*.



	<transformation>	[state]
short-term		
long-lasting		

translocation

translocation, **przeniesienie**

Translocation is the act of alternating the location of an entire artefact or of its portion(s).

We will consider an artefact as "*translocated*" if, and only if, the artefact after being physically moved from one location to another is still recognised as the same object (*i.e.* under the same identity).

Portions of artefact may be "*translocated*" as well, and may subsist in one, or several locations in the same time even after an annihilation of the initial artefact. They should be therefore clearly identified as ***translocated portions*** (or fragments), and should not be confused with the ***initial artefact***.

A →*translocation* of an ***initial artefact*** is a two-phase transformation. The first phase is disassembly of an artefact and the second is reconstruction of the object at its final destination (see Fig. a-h).

A →*translocation* of a ***fragment of an artefact*** is a single-phase transformation for the *initial object* (disassembly and transport of fragments to another place) (see Fig. j-o). The second phase may appear in case of significant fragments (see Fig. i, p-s). In this case, →*translocation* opens a new **primary** life cycle for the 'fragmentary artefact'. The initial artefact (remaining parts located at the original emplacement) may continue its current life cycle (see Fig. p and s), enter into a secondary life cycle (*e.g.*, →*hibernation*) (see Fig. r), or even disappear (*cf.* →*split* (see Fig. i), →*extinction*).

A necessary condition for a →*translocation* is a material transfer of existing parts of the object from one place to another, for example, a reconstruction of an artefact in different place preceded by a destruction of the initial artefact is not a type of →*translocation* (*cf.* →*move and swap*).

<transformation>

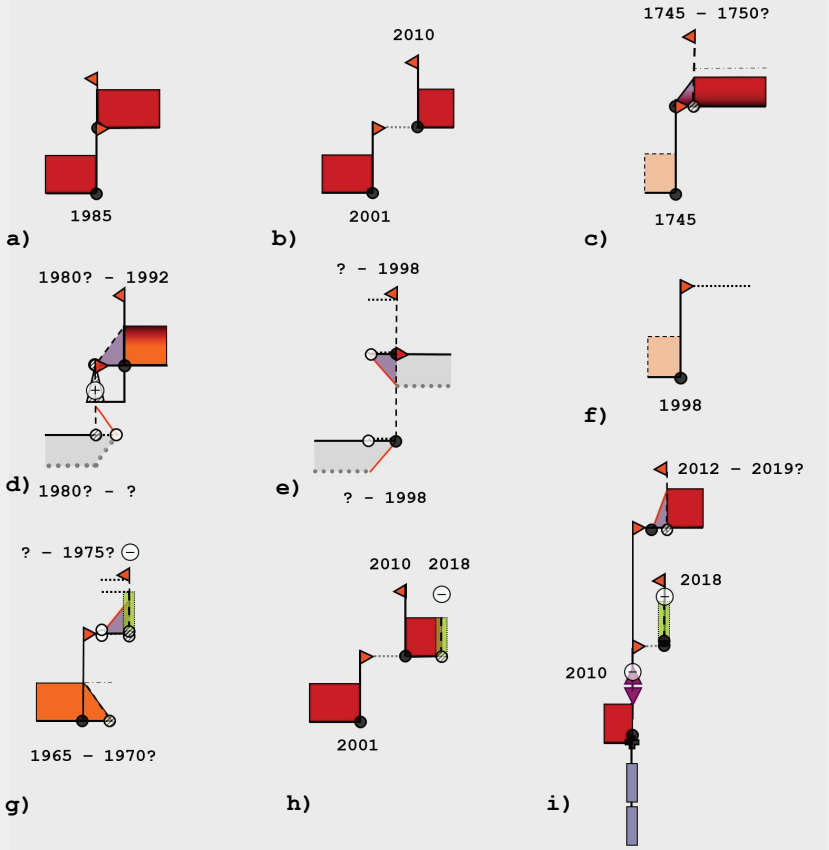
A →*translocation* may be a **global**, or a **partial** transformation. Partial translocations alter initial object – **altering** t. (see Fig. j-s), while global translocations are **terminating** and **transmigrating** transformations (see Fig. a-h).

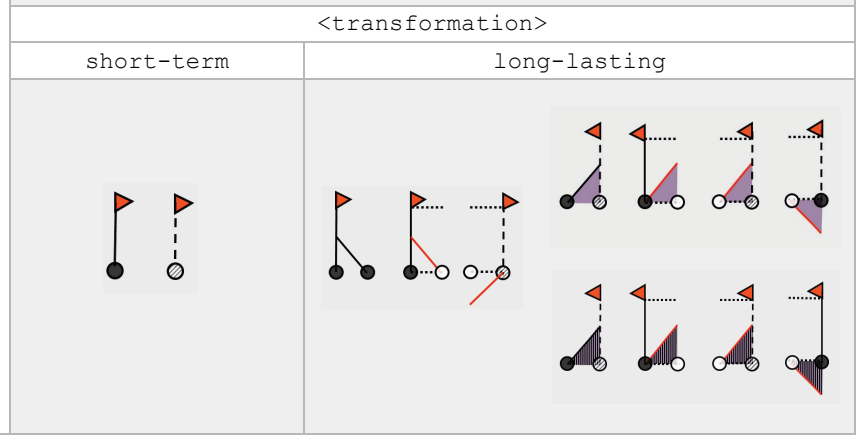
A →*translocation* may affect overground parts, as well as concealed elements, in an active or inactive state.

It may modify the state of an artefact or of its portion from an **inactive** state into an **active** state (see Fig. d) and vice versa. It may also transform **concealed** portions into **overground** ones (see Fig. d).

Translocated artefact may be therefore in an **active** (see Fig. a-d, h and i), an **inactive** (see Fig. e and f), an **overground** or a **concealed** state.

Both phases of →*translocation* may take form of a **short-term** event (see Fig. a-c, h, i, j-l and n), as well as a **long-lasting** process (see Fig. d, e, g, m, o-s).





translocation

translocation, **przeniesienie**

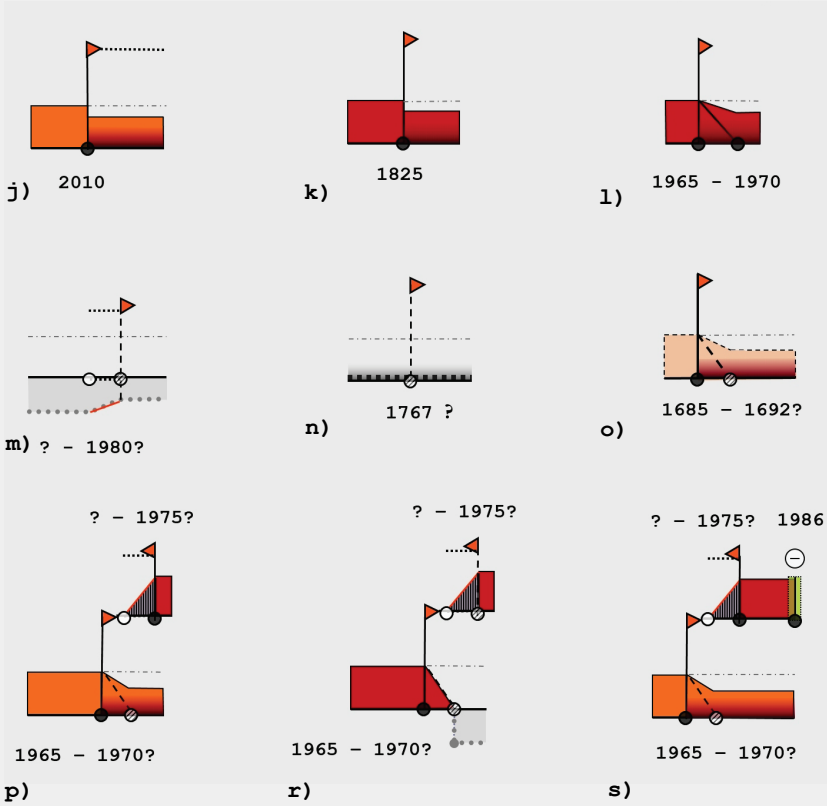
It is an **independent** and potentially auto-reversing transformation.

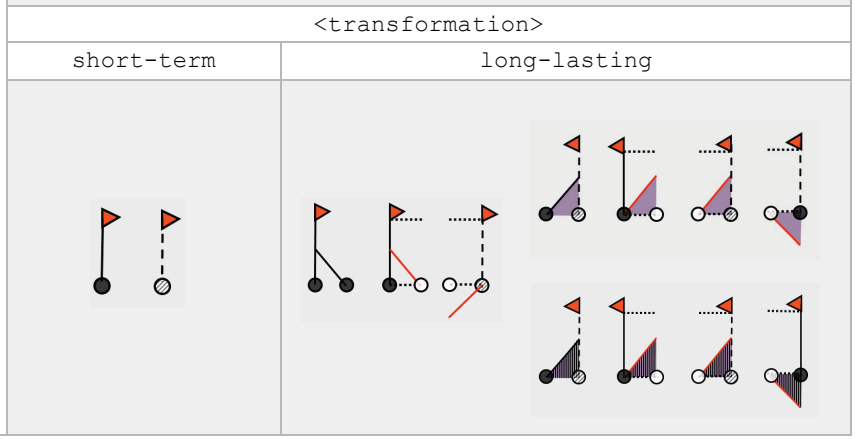
After a **global** *→translocation* an artefact preserves its identity unless it is accompanied by parallel transformations like an *→annexation* (see Fig. g), a *→merge* (see Fig. h), or a *→split* (see Fig. i).

Translocated fragments moved to different emplacements, may be annexed by other artefacts (*cf. →annexation*) (see Fig. i and s), or exist as fragments.
We will not consider further evolution of fragments (*i.e.* only a disconnection of a fragment from the initial artefact will be shown) (see Fig. j-o).

The only exception from this rule is the case of a 'fragmentary artefact' (*i.e.* A translocation of a significant fragment of an artefact that gains individual existence but remains in terms of identity a part of initial artefact after being moved into a new location. In this case, parts of initial artefact remain at the original emplacement) (see Fig. p-s).

Do not confuse a *→translocation* with a *→creation or with a →move_and_swap* transformation.





move_and_swap

délocalisation, **zmiana lokalizacji**

<glo> <ter> <trans> <res> <short> <last>

_s_ _u_

Move_and_swap means removing an initial artefact (*cf.* →*destruction*) and replacing it with another one located in a different emplacement. The new version of the artefact functions as a substitute for the initial one and swaps its identity.

A necessary condition for this transformation is that the construction of the substitute should happen in the aftermath of the initial artefact's destruction. A longer lapse of time disallow this transformation (expiration of a possibility of adoption of the identity by the new artefact).

In the case the *move_and_swap* transformation the initial artefact is destroyed to the extent that excludes a possibility of a →*reincarnation in situ*. An eminent →*destruction* is therefore a necessary condition for a →*move_and_swap* transformation to take place.

<transformation>

A →*move_and_swap* is a **global** transformation.

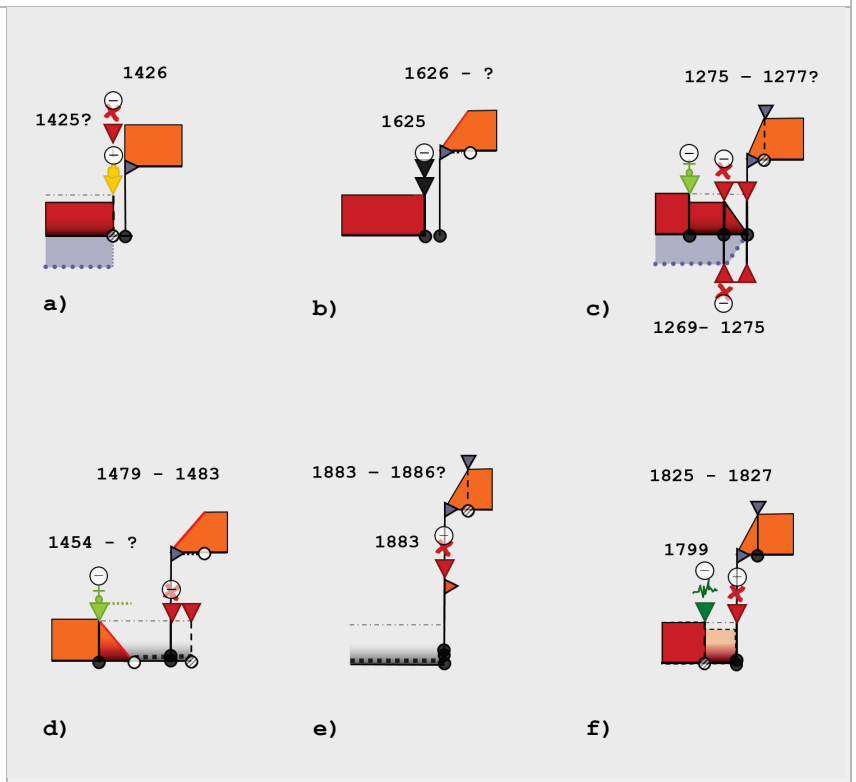
It is always a **terminating** and **transmigrating** transformation – it marks the end of the current cycle of live and starts a new **uniform**, **secondary** cycle of life in a different emplacement. Therefore, the result of a →*move_and_swap* is always a new artefact in an active state.

It is a **resulting** transformation. It always occurs after a preceding →*destruction* but the presence of a →*destruction* does not always entail a →*move_and_swap*.

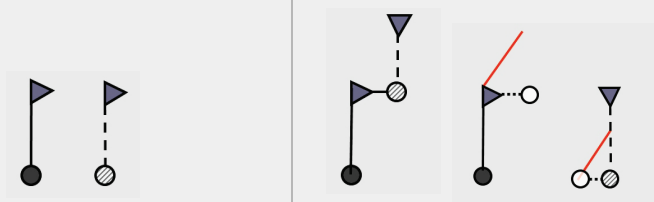
Move and swap transformation may be a **short-term** event (see Fig. a and b), as well as a **long-lasting** process (see Fig. c-f).

Do not confuse a →*move_and_swap* with a →*translocation* in which an initial artefact is moved into a new emplacement.

Do not confuse a →*move and swap* with a →*creation*.



<transformation>	
short-term	long-lasting



enclosure

encerclement, **obudowanie**

<glo> <alt> <ind> <short> <last>

_p_ _s_ _u_ _c_

Enclosure is the act of building a new artefact around another, in such a way that the initial object gets fully surrounded and separated from the outside world by the new artefact. The identity as well as structural integrity of the enclosed artefact remains intact.

We consider an artefact as *enclosed*, if its access (may it be by ground or by air) implies entering in another artefact.

<transformation>

Enclosure is a **global** transformation - it concerns an entire artefact and alters the way the artefact can be accessed but not the artefact itself. Enclosure does not result in a change of a cycle of life of the enclosed artefact. It is always an **altering** transformation.

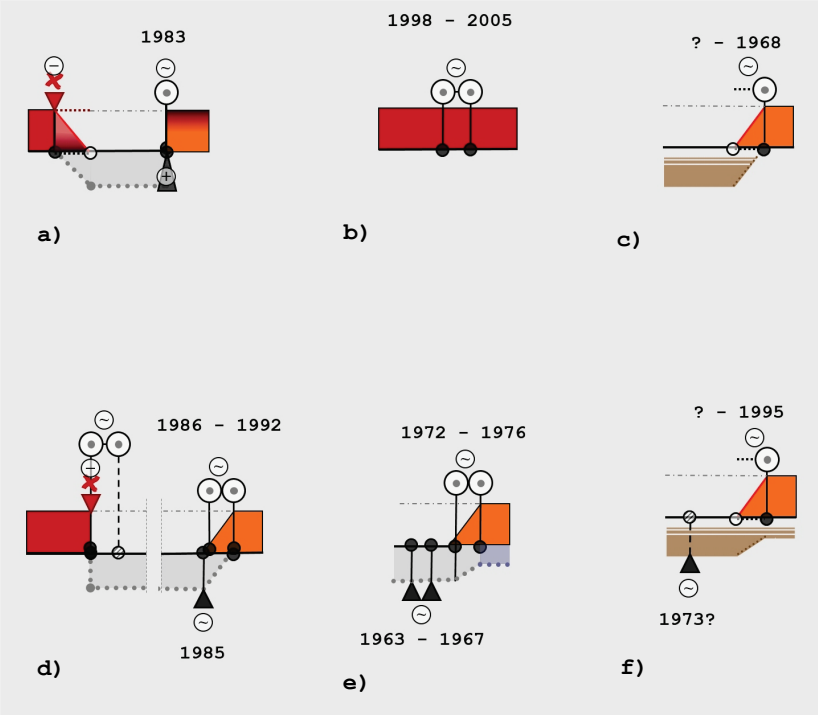
This transformation may be a **short-term** event (see Fig. a) or a **long-lasting** process (see Fig. b-f).

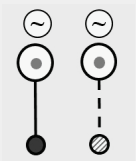
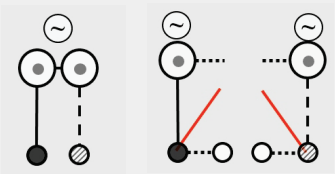
It is an **independent** transformation that can occur both in a **primary** (see Fig. b and d), or in a **secondary** (see Fig. a and c-f) life cycle of an object.

An enclosed artefact may be an **overground**, or a **concealed** artefact in an **active** (see Fig. a-f) or an **inactive** state (see Fig. d).

An →*enclosure* may appear in a **uniform** (see Fig. a-c) or a **compound** (see Fig. d-f) cycle of life.

It is always an **altering** transformation.



<transformation>	
short-term	long-lasting
	

vestige

vestige, **relikty**

[ina] [app]
_p_ _s_ _c_ _u_

Vestige are overground traces remaining *in situ* of an artefact that has been significantly altered, to the extent that it at some point entered into a state of ● *decay* ● *hibernation*, or ● *segmental anaesthesia*. If remnants of the artefact have been at least partially recovered, preserved and maintained they will be called vestige. They are partial remains – often considerably degraded – of past structures.

We are talking about a ● *vestige* exclusively in the case of overground **inactive** remains, which have no other function than relics of the past objects and have been intentionally preserved in this form. Often it coexists with underground, unexplored and inaccessible parts of the original object (*cf.* →*segmental anaesthesia*).

A ● *vestige* is by principle a roofless structure, even though it may be protected by a covering which, however, is not a part of the vestige itself, but is a separate, independent protective structure.

[state]

A ●*vestige* is an **inactive** and **overground** state consisting of material fragments left from an artefact *in situ*.

A transformation that leads to the state of *vestige* may be a **global** (see Fig. b), or a **partial** one (see Fig. a, c-f). It may have an **altering** (see Fig. a), or **terminating** and **transmigrating** character (see Fig. b-f).

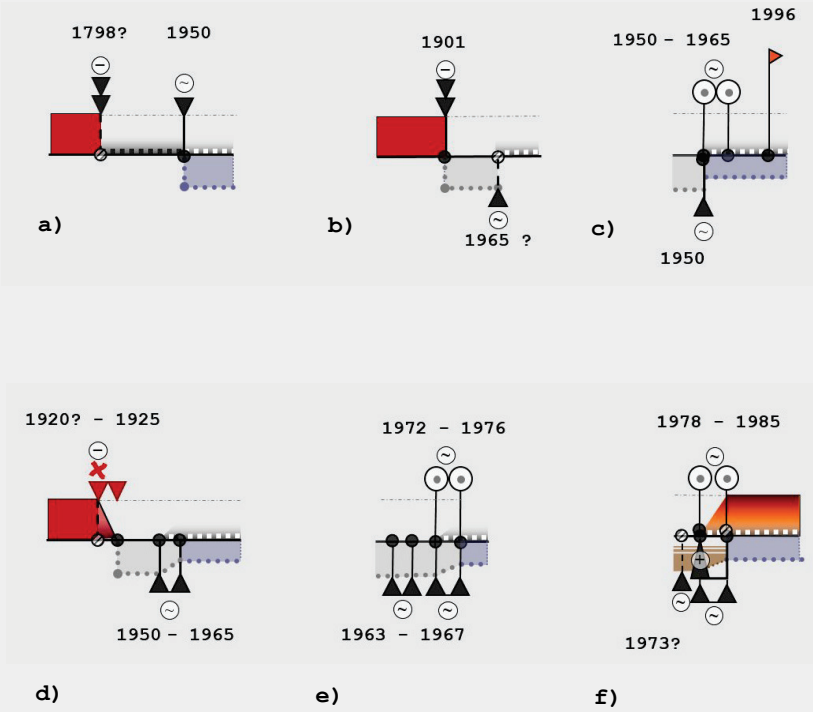
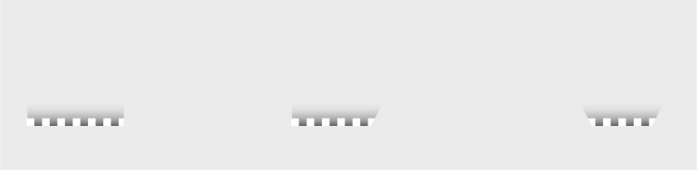
Only a →*modification* may lead to the state of *vestige*.

The state of *vestige* may appear both in a **primary** (see Fig. b), or a **secondary** (see Fig. a, c-f) life cycle. It may appear in a **uniform** (see Fig. b) life cycle, but more frequently emerges within **compound** life cycles (see Fig. a, c-f).

A ●*vestige* may emerge as a result of a **short-term** transformation (see Fig. a-c), or a **long-lasting** transformation (see Fig. d-f).

An artefact in a state of vestige may be enclosed by a new artefact built around it (*cf.* →*enclosure*) (see Fig. c, e and f).

Do not confuse a ●*vestige* with ●*decay*.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