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Thesauri of Historical Periods – A Proposal for Standardisation

Summary

In this paper we present the development of a methodology for creating multilingual thesauri of period names based on CIDOC CRM, archeological theory and results from Computer Science and Knowledge Representation. Periods are defined by identity criteria (coming from the archaeological evidence) rather than by time and place. A formal model in the form of XML DTD has been developed as a proposal of standardization for period thesauri. An example thesaurus of Helladic periods is used as a proof of concept.

1 Introduction

The complex and multidimensional notion of cultural (historical or archaeological) period makes quite difficult a definition and a formal analysis of period and generally a relative chronological documentation. A schema specification has been proposed by the CIDOC Archaeological Working Group in order to define periods and their relations and to facilitate the exchange of cultural information about them. Standards for topical thesauri, such as ISO2788 are not capable to describe adequately the relevant spatiotemporal and cultural relationships. ISO2788 is a guideline for the development of thesauri, using general principles that apply to any subject field (ISO2788 –1986, ISO5964 –1985).

This paper presents the development of a methodology for creating multilingual thesauri of period names based on the specifications of CIDOC, archaeological theory and results from Computer Science and Knowledge

Representation. An intermediate report has been given at CAA2004 (“Which Period is it? A Methodology to Create Thesauri of Historical Periods”: to be published). The application of this methodology is a formal model (in a form of XML DTD), which has been tested by an example thesaurus of period names from the Helladic period.

The design of such thesauri contributes to: the basic problems of how to define cultural periods and their interrelations (even when precise time, space and other properties are debatable or even unknown), and to the applied problem of communication, that arises because of disagreements between scientists about the definition of periods (and generally on relative chronology) and the respective terminology, and their use in the literature.

The presented methodology does not aim at the prescription of correct scientific opinion: rather, it aims at the overview and combination of established, alternative opinions using a methodical, comprehensive approach. Scientists should have access to the opinions and definitions in use by different scientific communities so that they can effectively carry out comparative studies of literature and archaeological evidence and come to valid conclusions.

Based on that, a formal model has been developed and proposed as a standard format, in continuity with CIDOC CRM (ISO/CD21127), taking up an initiative of the CIDOC Archaeological Working Group, a working group of the International Committee for Documentation of the International Council of Museums (CIDOC). This holds the view that thesauri are collections of terms with generally agreed-on semantics and not individual definitions or representations of a concept (Doerr and Kalomoirakis 2000). Well-designed thesauri of cultural periods should help to:

- define cultural periods and phases based on the distinct characteristics of the archaeological contexts that are used by the respective scientific community to identify their unity, rather than by time and place,
- organize the relevant archaeological information about periods in a consistent and comprehensible form in a computerized environment,
- classify museums objects with respect to chronology consistently, in particular between different geographical areas,
- identify finds and assess chronology in archaeological research and excavations
- facilitate better communication and knowledge sharing about periods between archaeologists, through a standard representational structure.

2 Previous Work

The issue of representing cultural periods and reasoning about temporal problems had been addressed and studied by different cognitive fields and sciences.

On one side, computer science concentrates on temporal reasoning in controlled industrial environments, typically using discrete events and time intervals, neglecting spatiotemporal dependencies (e.g. Theodoulidis and Loucopoulos 1991, Ligozat and Vila 1998, Cowley and Plexousakis 2000). Allen's logic, for instance, is only temporal - not spatiotemporal. (In fact it is included in the CRM). Allen (Allen 1983) searches/refers to techniques (by describing relationships between temporal intervals) available for representing time knowledge in general applications as needed in Artificial Intelligence.

Spatial reasoning (through region-based theories that mirror interval-based theories) has been done by (Cohn, Bennett, Gooday and Gotts 1997). In addition, there is considerable research and development into spatiotemporal databases (e.g. Koubarakis, Sellis. et al. 2003) to study the evolution of ecological, economical or other phenomena on earth. Most reasoning in computer science restricted to calculating operations with temporal information, purely spatial or spatiotemporal, rather than semantics of contextual properties.

On the other side, archaeological theory has not provided any complete theory. Systems for chronological reasoning in archaeology typically concentrate on statistical approaches to date archeological strata. These approaches normally regard the studied phenomena as simple, well-defined and associated with precise points in time. The Perseus Digital Library (Smith 2002) uses spatiotemporal maps and indexes to search for documents about events.

The archeological notion of cultural periods is based on cultural semantics. Chronological systems based on such periods are notoriously controversial, due to the complexity of the relationships between contextual phenomena and spatiotemporal values. Nevertheless, they play a key-role in archeological discussion. Several projects have attempted to define standard systems of periods for indexing databases, interpreting the spatiotemporal or stylistic inclusion as a "broader/narrower term" relationship based on ISO2788 (e.g. The J.Paul Getty Trust College Art Association 2000, AAT 2000). This approach is not expressive enough to capture the actual complexity, resulting in differences between chronological systems being able to be justified by the differences in the initial definition and subsequent (re)interpretation of observations. The British MIDAS (MIDAS 1999) standard and the ArchTerra Project (van Leusen 2000) define maximum/minimum dates in addition to broader/narrower relationships for periods. Intuitively, many systems regard points in time as a means to recognize events and the temporal end-points of periods, confusing definition with conclusion, and identity with non-unique properties (actually, the absolutely precise point in time when an event happens is not observable).

The final area of previous work is the CIDOC CRM (Doerr 2003, Crofts, Doerr, Gill, Stead and Stiff 2004.) which develops a general ontology (Guarino 1998) about cultural documentation. The CRM models periods as a generalization of

events, which occur in space-time. It uses temporal and spatial relationships even for cases where absolute time and space are unknown. The notion of history is based on timelines of objects becoming manifest in events. It is the first widely accepted formal ontology that defines historical and archaeological periods and the fundamental relationships to events and things, a result of years of interdisciplinary work and analysis of documentation practice in museums and archaeology. As its primary role is to enable exchange and integration between sources of cultural heritage, it does not go into the details necessary to create and manage a thesaurus of periods. It does not propose a standard format nor does it analyze how to define a period.

This work seems to provide the first specification of a document structure for thesauri of periods, which goes beyond general models for thesauri and is based on a scientific interpretation of archaeological theory and computer science.

3 Methodology – the development of a schema of period thesauri

In this work we developed a methodology, which maintains the basic functions/stages of a life-circle of a thesaurus. Descriptors are used to identify a concept. The data that relate terminology and concept definition support the classical thesaurus functions (Soergel 1996, Doerr and Fundulaki 1998):

- guidance for the user to find a concept in the thesaurus,
- clarification of its meaning,
- unique identifiers to be used for effective identification, indexing and classification of the (archaeological) material
- preservation and update of information, through a process of proposals/submission of new terms or of modifications on introduced terms. This process has been structured in another schema (fig 1). It is regarded as a necessary process since it contributes to the completeness and final edition (through a version control) of the period thesaurus (Doerr and Fundulaki 1998).
- a frame of an ontology for standardization of elements. (Doerr and Fundulaki 1998). An ontological analysis, which aims at supporting: reasoning about the relations between periods, and periods and finds.

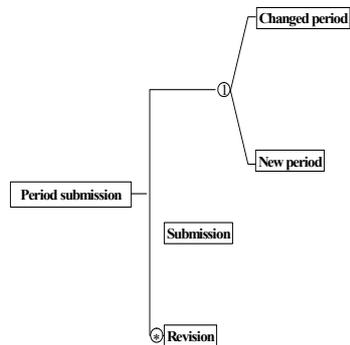


Figure 1 Schema of period submission

Actually, this work combines both ontological and terminological aspects. In fact, it is defined as an ontology, which is supported by a schema used for the creation and management of period thesauri. This schema combines features of common thesaurus management practice (Soergel 1996, Foskett 1997, Doerr and Fundulaki 1998) with structures specific to period definitions.

The schema is expressed as an XML DTD (fig.2, 3), which can be used directly by XML editors, native XML databases and can also be easily converted to other data-models or encoding schemes. The schema describes a single period concept as a single document (in the sequence called “period definition document”) that may link to other period definition documents and auxiliary concepts, such as bibliography or gazetteer entries. A period thesaurus is built from a set of consistently linked period definitions.

The schema comprises multilingual terminology for the period, the period definition in the narrower sense, its analytical spatiotemporal extent and spatiotemporal relationships, characteristic attributes and cultural influences, metadata about the initial conception of the period and the document that first defines it (the definition document).

The following section justifies the proposed methodology and the choice of the major elements.

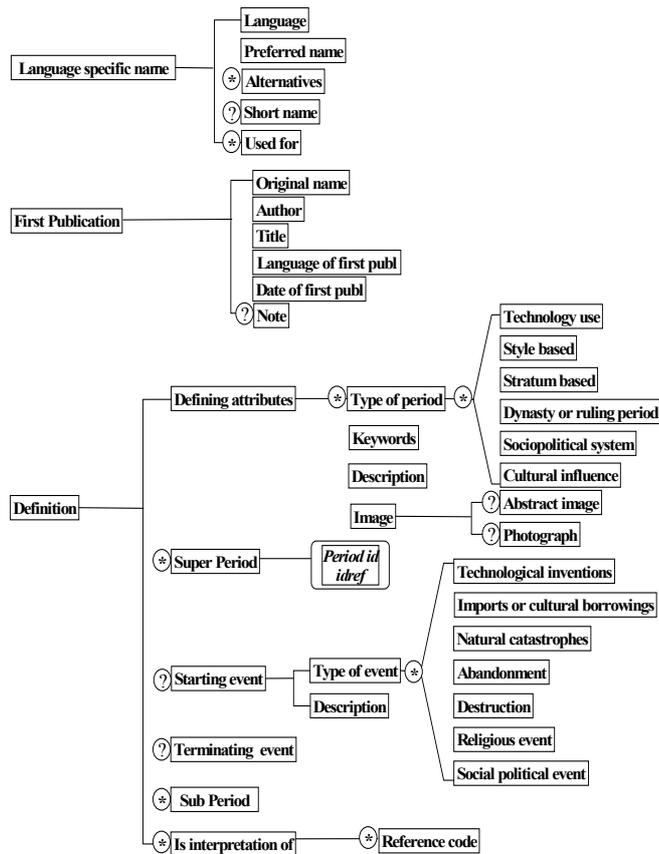


Figure 2 Part of the Schema: Terminology and Definition

3.1 Terminology

Archaeologists create terminology about periods in order to classify finds by a schema of relative chronology (periods) and to relate sequences of settlements and cultures. The use of a certain terminology implies a number of ideas that may differ from researcher to researcher, so that there is a tendency to define cultural periods of even the same culture differently and to use different terminology for them (e.g. questions about the definition or even existence of the Early Minoan III period caused disagreements between archaeologists in the past –see Zώης 1967, Warren 1984). Period names may represent the same or different concepts depending on the view or social group. Traditional names may be preserved, altered or redefined (Barber 1987) on the base of earlier literature. Even if an established terminology about periods exists, it sometimes operates against explanation and understanding. (see comments on tripartite system of Evans, made by Dickinson in Dickinson 1994) The nomenclature principles lead to ambiguity since a name may designate several concepts. The problem is similarly

known from biological species definitions, and seems to be common to taxonomies that follow the evolution of science.

For that reason, we identify a period concept with the term plus a reference to the first known publication that actually defined it, just as it is good practice in biology (Berendsohn 1995). We propose to create unique preferred terms as in biology (e.g.: '*Fringilla coelebs* Linnaeus, 1758'). If details of the original definition have undergone some evolution, we would refer to the most recent interpretation of it. This case is distinct from an actual redefinition, which would give rise to a new concept. In the case of diverging interpretations, we also propose to create two distinct definition documents. Any number of synonyms in any natural language may be added. Synonyms need not be unique. They guide the user to the concept and preferred term. A URI ("universal resource identifier") may serve as language-neutral, machine-processable identifier (see fig. 2).

3.2 Definition

Definition is the most important information category. It is about defining every notion of period in a specialized way. "Cultural period" is a multidimensional concept about complex interrelations between cultural phenomena. The CIDOC CRM defines the basic notion of a period as: "This class comprises sets of coherent phenomena or cultural manifestations bounded in time and space. It is the social or physical coherence of these phenomena that identify an E4 Period and not the associated spatio-temporal bounds. These bounds are a mere approximation of the actual process of growth, spread and retreat. Consequently, different periods can overlap and coexist in time and space, such as when a nomadic culture exists in the same area as a sedentary culture. ...". (Crofts, Doerr, Gill, Stead and Stiff 2004). This definition is based on a notion of coherence, a "unity criterion" in the sense of (Guarino and Welty 2002), that relates phenomena such as people following a certain life-style, political decisions, an economy etc. The CRM definition goes actually beyond cultural periods in the narrower sense, but we shall adopt this definition here, intuitively restricting it to "cultural" periods.

As culture evolves gradually, respective characteristics increase and decrease in frequency and strength. This makes the definition of a period necessarily fuzzy with respect to space-time, but it makes the periods themselves not less real or objective. Rather, spatiotemporal bounds make no sense beyond a certain degree of precision. Further, culture evolves in many directions at the same time. The degree of synchronization between different kinds of phenomena, such as style and political system, may vary considerably. This gives rise to multiple points of view. Necessarily, such views differ objectively in their spatiotemporal bounds. Finally, archaeological observation is restricted to the products and traces of some of these phenomena. The degree to which these are correlated to the non-observable phenomena, gives rise to subjective interpretations. Jean-Claude Gardin (Gardin 1990) analyzes this process in general terms. We try to make the distinction of Gardin's "M₀" from the following sets M_i explicit.

We therefore propose to distinguish between the phenomena, that have left distinct traces and are taken as objective *indicators* for the *coherence* of the respective period (the identity criterion), and other characteristic phenomena, distinct or not, that are either product of *interpretation* or that are *not directly associated* with the coherence of the period as a whole. For instance, “Ming dynasty” is defined by the political system. Any change of our knowledge about the dates of rule of the Ming emperors will change the asserted temporal bounds of “Ming dynasty”. In contrast, Ming porcelain is a good indicator for dating finds from the Ming dynasty. However, change in our knowledge of the dates of production of a certain Ming porcelain style will not affect the temporal bounds of Ming, but at most characterize this style as no more central to Ming etc. In this case, the political system provides the identity criterion, and the porcelain production just a *distinct, characteristic* phenomenon of this period.

Identity criteria are types of reported phenomena or the kinds of their observable traces that determine the unity and identify the cultural continuity of a period. We distinguish an instance of a period from another by a defining, unique “property”. By this property, any event, part or phase of the period is recognized to belong to the same (existence) period.

Archaeologists usually define and divide periods by stratigraphic and ceramic evidence – very easily especially when there are clear stratigraphic sequences. Particularly, Aegean archaeologists seem to see the passage of time in terms of ceramic typology (McNeal 1975). The recognition of a Style/Ware and its development may determine a period or a phase. Style can be used to sort and distinguish spatiotemporal cultural groups – culture includes style (Hodder 1987) - by specific characteristics; through a specific shape or decoration, style represents the specific society, which produced it (Renfrew and Bahn 2001). In such cases, we regard the period to be defined by style. Hence the appearance of the respective style is the ultimate criterion for the associated spatiotemporal bounds, and not the assumed political system or whatever other phenomena a researcher may associate with the observation of this style.

We are still investigating the characteristic kinds of criteria to define a cultural period. In the sense of (Guarino and Welty 2002), we regard a notion like “style-period” as a “rigid” property bound to the whole existence of any of its instances. As such, it “carries an identity condition”, such as “having the same style throughout its duration and spread”. This approach allows us to objectify the discussion, if different opinions about a period are due to different definition or due to different stages of knowledge or interpretation.

An example of distinct definitions (based on different “defining criteria”) and consequently, different types of periods, is that of Middle Minoan Ib and Old Palace period. Even though it has almost the same time-span and is about the same cultural phase (Minoan culture in Crete), it is interpreted in two different

ways: MM1b is defined by A.Evans (Evans 1921) as a *stylistic period* because of a specific MM1b Style (Barbotine, Polychrome Ware etc.) during that phase, and Old Palace period is defined by N.Platon (Πλάτων 1978) as a *social-political period*, determined by the development of palatial system (foundation of palaces - destruction of palaces). In this case, divergent “defining criteria” are used to introduce different instances of periods (classifying in different types). The most important is that the objective description of their opposite opinions/definitions will not change, even if absolute chronology of the one or the other changes in time.

So far, we have identified the following classification of identity criteria: style, socio-political system, technological capabilities, strata, and cultural influence. This list will be refined and extended in the near future.

3.3 Events and Periods

Some events are closely related to the definition of a period. We mark them as “starting event” or “terminating event”. A frequent intuition is that some kind of distinct event should be responsible for the upcoming of a new cultural phase (as required by Biers 1992). The question is: can a single historical, religious, military, political or physical event have a definitive affect on a period? Did, for example, an earthquake or a volcano eruption as the one that happened in Santorini determine the specific period? We regard that an event may be one of the catalytic factors to social change and thus be loosely synchronized with the end points of a period. Only the rare cases of complete extinction actually terminate a period in the absolute sense. Generally however, we do not regard those events as causal to the properties of a period, and the change of a period may quite well happen without such an event. Therefore we use these events as chronological markers, “meetings” (Doerr, Plexousakis, Kopaka and Bekiari 2004) of items, objects and persons that were present in states/events, rather than as part of the definition. Such events are not regarded to be creating types of periods in the sense of cultural phenomena.

3.4 Spatiotemporal Extent and Relationships

If we accept that the “substance” of a period is made of cultural phenomena, quite naturally these phenomena cover an irregular area in space-time. A period may slowly spread out from a kernel region, and still flourish at distant areas when it has vanished already at its origins. In other cases it may again “retreat” to its origins, or even separate spatially. The precise boundaries are naturally fuzzy, except may be for cases of modern political systems with precise geopolitical boundaries at any time and islands. Even then, the precise boundaries may be too complex for the utility of a general thesaurus. Therefore we foresee two kinds of approximation (fig.3) of absolute bounds.

The first (“max space-time”) serves rough orientation and narrowing down database searches for finds: The total of all places where the period flourished at any time is approximated by an outer (larger) *spatial bound*. This might be by the identifier of a geopolitical or geological unit, or by a geographical

polygon, or both. The starting phase and the terminating phase when the overall period flourished is approximated by outer *temporal bounds*, expressed by two date ranges. Note, that last date for the begin might be after the first date for the end.

The second (“Space time analysis”) serves a more analytical description, in particular for cases where the dates differ significantly from place to place. (fig.4) For this purpose, we foresee a break-down of the total area into individual subareas (fig 5), which can be associated with individual data ranges, in the same way as for the overall approximation. In general not all individual places, where a culture flourished, may be known. Our knowledge is incomplete or changes in time. Therefore the space- time analysis is normally an incomplete list of individual centers of a culture. Areas included in the “max space time” but not in the space-time analysis imply such areas for which a reliable assignment is unknown. The given schema allows to capture the characteristic practice of chronology tables as shown in fig. 4. This table shows the analysis of Early Cycladic period in discrete geographical areas (islands) – cultural groups, with various date ranges for each group, which are still part of the general chronological framework of Early Cycladic period.

It is however not our intension to compete with GIS systems or spatiotemporal databases, but to assist a reasonable recall and precision at general collection management systems or digital libraries.

Absolute bounds allow to calculate many spatiotemporal relationships, such as temporal succession, spatial separation etc. When these bounds change, the relationships can be recalculated. We therefore do not propose a documentation of such deductions from absolute places and times in the thesaurus. Archaeological evidence nevertheless allows to directly infer rich relative spatiotemporal relationships. In this case we foresee their documentation, providing a standard set of purely spatial, purely temporal (Allen 1983), and genuine spatiotemporal relationships taken from the CIDOC CRM. They comprise in particular relationships of succession and containment that are the result of an intellectual breakdown of larger periods into subperiods as part of their definition.

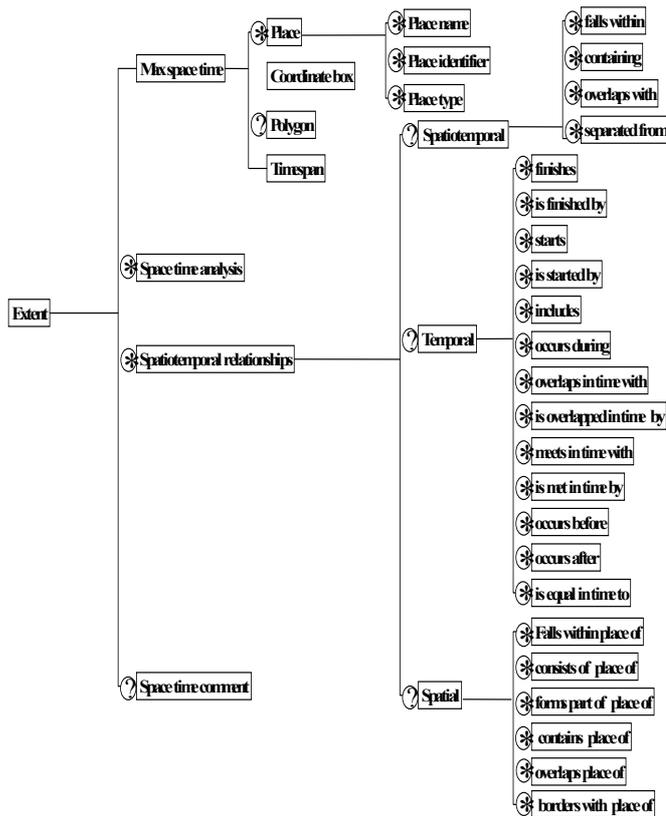


Figure 3 Part of the Schema: Spatiotemporal Extent

3.5 Characteristic Attributes

Contrary to “defining criteria”, general characteristics of a period can be documented as part of their description. General characteristics are not part of period definition because they cannot change or determine the existence and the identity of a period. There are types of characteristics, such as technological activities, social-political structures, economy and trading, history of war activities (and sequences/results), patterns of settlements and belief systems, generally different aspects of material culture. They do not define, but simply describe, and interpret a period. They are cultural activities that develop and vary during time- cultural phases, products of past human behaviors representing/describing progress in cultures and life. Some of these characteristics may be distinct from those of other periods, and be helpful to identify finds, such as the Ming porcelain, or the “index fossils” in geology. These are marked separately in the schema.

Thera, Ayia Irini on Kea and Phylakopi on Melos) and a strong cultural influence (specifically, the strong appearance of Minoan objects in Cyclades).

According to Barber, the dramatic event of the eruption of the volcano in Santorini is regarded as a “terminating event” (of type “natural catastrophe”), i.e. it ended the specific period and is used as a chronological mark of LCI period (and perhaps of others periods too; in that case there is a relationship of synchronism between periods). This does neither mean, that the eruption terminated immediately the culture, nor that we take any personal position. Rather, we render the chronological relation about the impact of the event that Barber claims.

The dates of absolute chronology of LCI are based on different evidence than the recent doubts about the date of the eruption (from polar ice analysis or tree rings). This demonstrates the utility to register both, widely accepted absolute chronology and distinct events that might help update the chronology or interpretation in the future. I.e., if the new dates for the eruption (Manning 1999) are confirmed, either the interpretation that it terminated LCI is wrong (there is also the opinion that the eruption occurred at the beginning of the period) or the absolute chronology. In the latter case, periods for which a synchronism with LCI has been established from *independent* evidence as described in 3.3 have to change absolute chronology etc.

It must be clear, that a thesaurus can never reflect absolute truth but only a *historical* stage of knowledge.

5. Conclusions

By this work we developed a formal methodology to capture period definition and description based on CIDOC specifications, archaeological reasoning and computer science. Terms and relations are structured in a schema in the form of XML DTD, which has been already confirmed by the creation of an example thesaurus of Helladic (prehistoric) periods.

The schema provides the first specification of a comprehensive document structure for thesauri of periods, which goes beyond general models for thesauri (ISO2788) and analyzes in depth the conceptualization of *period*. This schema is an application of the CIDOC CRM and is proposed to be taken up as a possible standard by CIDOC for period. This could serve as a guide for good practice of modeling periods, coming from discussions between working groups, proposals for improvement, and tests that will prove its functionality and value.

Finally, the proposed schema and an example of period thesaurus, has been available and published at the CIDOC CRM Website (CRM).

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INDEX OF PERIOD

[P8 Middle Minoan Ib](#)

[P9 Παλαιοανακτορική](#)

Middle Minoan IB

Author: Sir Arthur Evans

Title of first publication: The Palace of Minos, vo.I-IV

Date of first publication: 1921

Note: First author: Karl Hoeck: Kreta I-III, Ein Versuch zur Aufhellung der Mythologie und Geschichte der Religion und Verfassung dieser Insel, von den Altesten Zeiten bis auf die Romer-Herrschaft (1823-1829). A.Evans provided an outline of a scheme by which Minoan civilization was divided in periods, in 1906 under the title of "Essai de classification des epoques de la civilisation minoenne".

Period id: P8

<u>Terminology in :</u> <u>Greek</u>	<u>Terminology in :</u> <u>English</u>	<u>Terminology in :</u> <u>Italian</u>
Preferred name: Μεσομινωική IB	Preferred name: Middle Minoan IB	Preferred name: Medio Minoico IB
Short name: MMIB	Short name: MM IB	Alternatives: Periodo Medio
Alternatives: Μεσομινωική IB περίοδος	Alternatives: Middle Minoan IB period	Alternatives: Minoico IB

Space time approximation:

Maximal extent:

Place:

Names: [Kriti](#)

Identifier: 7012056 [TGN]

Coordinate box:

West Bounding: 23 31 00 E degrees

East Bounding: 26 20 00 E degrees

South Bounding: 34 48 00 N degrees

North Bounding: 35 41 00 N degrees

Spatial referencing system: QTM

Time span:

Earliest beginning: 2000 B.C

Latest beginning: 1900 B.C

Earliest end:

Latest end: 1700 B.C

Spatiotemporal relationships:

Spatiotemporal:

separated from: [Late Helladic](#)

Temporal:

occurs during: [Minoan](#)

starts at the end of: [Middle Minoan IA](#)

Space time comment:

At Knossos three koulouras were found in the West Court and one in the Northwest corner under the Theatral Area. They are dated in the MM IB period .

Characteristics attributes:

Technology

The pottery is characterized by the first use of the fast wheel. The carinated cup first appears now. A more complex polychrome decoration is developed at this phase.

Social political structure

The first certain palaces are now constructed at Knossos and Phaistos.

Economy and trading

Trading contacts are extended to the central Aegean islands.

Defining attributes:

Keywords: Barbotine Ware. Polychrome

Description:

New styles in pottery which are

Beginning of polychromy.

Is part of: Middle Minoan I

Is interpretation of: [Evans 1921](#)



Administration:

Editor: Athina Kritsotaki

Date of compilation: 2004-06-05

Authority of administration:

Authority name: Helladic Period System

Contact point: email:athinak@ics.forth.gr

Place names:

Kriti [TGN, Greek]
 Crete [TGN, English]
 Kreta [TGN, German]
 Creta [TGN, Italian]

Παλαιοανακτορική

Author: Νικόλαος Πλάτων

Date of first publication: 1958

Note: It was a proposal (for a new chronological system) made by Platon in 1958 at the Prehistoric Conference in Hamburg.

Period id: P9

<u>Terminology in:</u> <u>Greek</u>	<u>Terminology in :</u> <u>English</u>	<u>Terminology in :</u> <u>Italian</u>
<p>Preferred name: Παλαιοανακτορική</p> <p>Alternatives: Παλαιοανακτορική περίοδος</p>	<p>Preferred name: Old Palace</p> <p>Used for: Protopalatial First Palace</p> <p>Alternatives: Old Palace period</p>	<p>Preferred name: Protopalaziale</p> <p>Alternatives: Periodo protopalaziale</p>

Defining attributes:

Definition based on: Sociopolitical system

Keywords: Palatial society



Description:

Age of palaces (Knossos, Phaistos, Mallia and Zakros)

-social ranking - kings and princes

Is interpretation of: [Πλάτων_1966,1978](#)

Terminating event: Natural catastrophes

Description: Earthquakes destroyed the palaces at the end of the period.

Space time approximation:

Maximal extent:

Place:

Names: [Kriti](#)

Identifier: 7012056 [TGN]

Coordinate box:

West Bounding: 23 31 00 E degrees

East Bounding: 26 20 00 E degrees

South Bounding: 34 48 00 N degrees

North Bounding: 35 41 00 N degrees

Spatial referencing system: QTM

Time span:

Earliest beginning: 2000 B.C

Latest beginning: 1900 B.C

Earliest end:

Latest end: 1700 B.C

Spatiotemporal relationships:

Spatiotemporal:

separated from: [Late Helladic](#)

Temporal:

occurs during: [Minoan](#)

starts at the end of: [Προανακτορική](#)

ends at the beginning of: [Νεοανακτορική](#)

Characteristics attributes:

Technology

Progress in metalwork and new types of tools. The end of Handmade pottery - Barbotine ware is now more popular and the use of Polychrome Style (Kamares) starts. Burial vessels are included too. Clay sarcophagoi and jars. Ossuary tholoi superseded by cists -continuity in using tholos tombs. Progress in the art of seals and of jewellery.

Social political structure

Social ranking. Palatial society. Great public works.

Settlements

MMI elements of palace at Knossos-wall construction and analysis.

Belief system

Peak sanctuaries. Individual burials are now established.

Economy and trading

Trading contacts with Egypt , Cyprus and Aegean.

Administration:

Editor: Athina Kritsotaki

Date of compilation: 2004-06-04

Authority of administration:

Authority name: Helladic Period System

Contact point: email:athinak@ics.forth.gr

Place names:

Kriti [TGN, Greek]
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Kreta [TGN, German]
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