

Applications of Cognitive Terminological Theories in Terminology Management
Zagreb – September 27-28, 2013

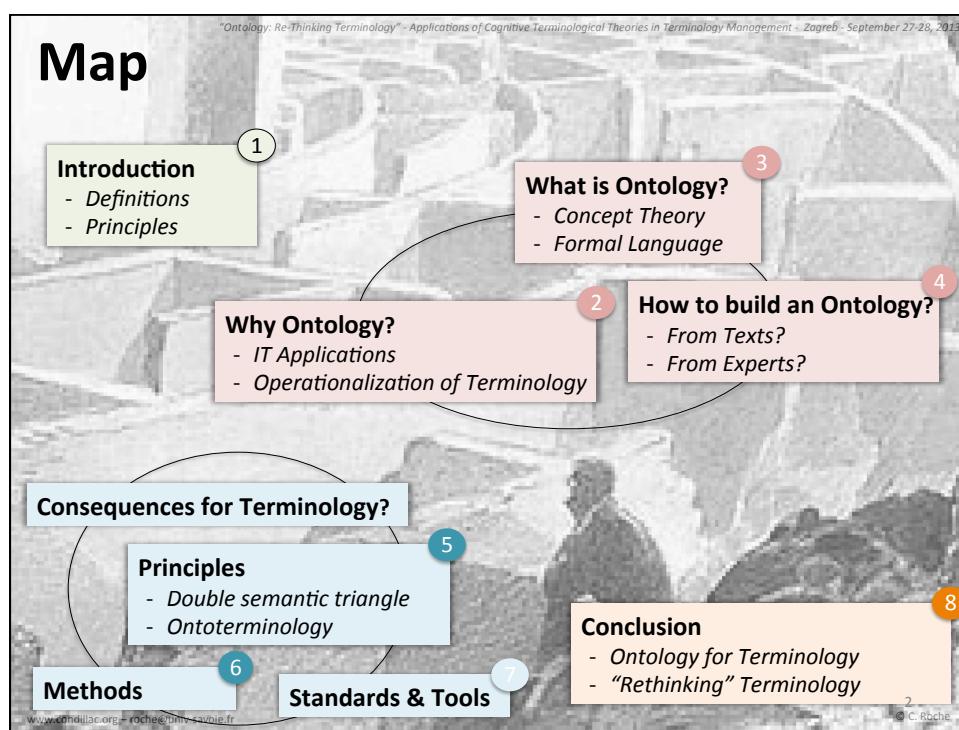
ONTOLOGY:

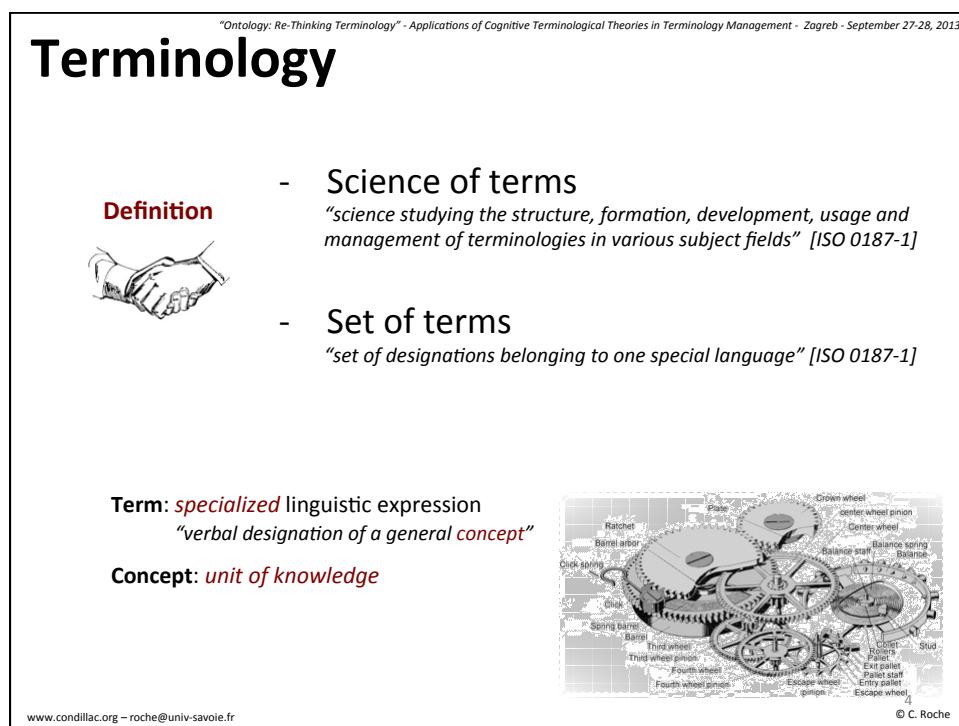
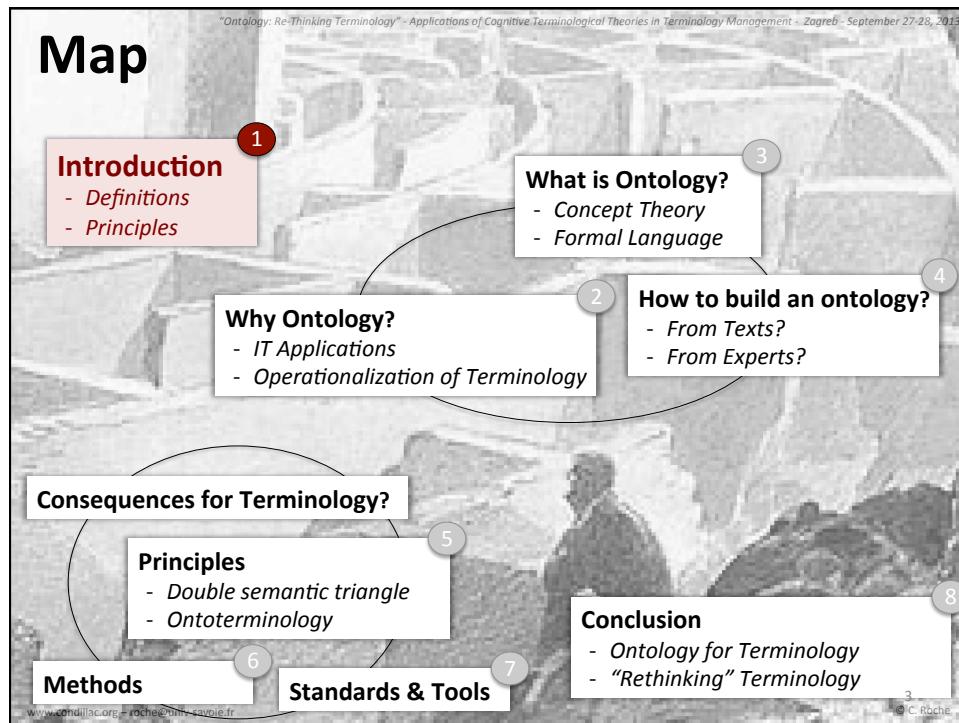
Re-Thinking

TERMINOLOGY

Pr. Christophe Roche
Condillac Research Group
University of Savoie- France
roche@univ-savoie.fr
www.condillac.org

1
© C. Roche





"Ontology: Re-Thinking Terminology" - Applications of Cognitive Terminological Theories in Terminology Management - Zagreb - September 27-28, 2013

Terminology

Onomasiology

Textual Terminology

Termontography

Ontoterminality

Conceptual Terminology

Socioterminality

Semasiology

www.condillac.org – roche@univ-savoie.fr

© C. Roche

"Ontology: Re-Thinking Terminology" - Applications of Cognitive Terminological Theories in Terminology Management - Zagreb - September 27-28, 2013

Terminology

Different Approaches

→ Different Results

- Who is right?
- Who is wrong?

⚠ Don't apply a non-suitable method to your problem

www.condillac.org – roche@univ-savoie.fr

© C. Roche

"Ontology: Re-Thinking Terminology" - Applications of Cognitive Terminological Theories in Terminology Management - Zagreb - September 27-28, 2013

Terminology

For What?






www.condillac.org – roche@univ-savoie.fr

7
© C. Roche

"Ontology: Re-Thinking Terminology" - Applications of Cognitive Terminological Theories in Terminology Management - Zagreb - September 27-28, 2013

Terminology

Translation



Is every **specialised linguistic expression** a term?

- must be translated
- is the **designated knowledge**:
 - a concept?
 - a “state of affairs” knowledge?

Ex: “crayon de combustible usagé”

Remarks:

- “Thousands” specialised linguistic expressions but not “thousands” of concepts
- A same object can be in different states
- No representation of concept

www.condillac.org – roche@univ-savoie.fr

8
© C. Roche

"Ontology: Re-Thinking Terminology" - Applications of Cognitive Terminological Theories in Terminology Management - Zagreb - September 27-28, 2013

Terminology

Experts



- Representation of conceptual system

☞ Formal Languages

- Denomination of concepts

☞ "univocity"

☞ the capacity of a term to signify outside any discourse

Remarks:

- Typology of knowledge
- Some concepts have no *designation*
- Reformulation of terms
Ex: "pastille B4C" -> "absorbant neutronique"

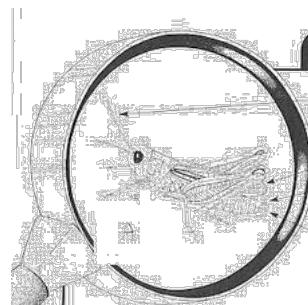
www.condillac.org – roche@univ-savoie.fr

9
© C. Roche

"Ontology: Re-Thinking Terminology" - Applications of Cognitive Terminological Theories in Terminology Management - Zagreb - September 27-28, 2013

Terminology

- What is a term?



- What is a concept?

Is a concept a "fixed" knowledge?

- <Engine>
- <Used Engine>

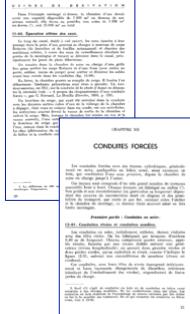
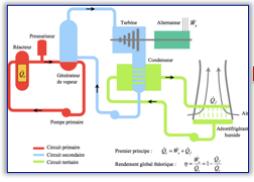
www.condillac.org – roche@univ-savoie.fr

10
© C. Roche

"Ontology: Re-Thinking Terminology" - Applications of Cognitive Terminological Theories in Terminology Management - Zagreb - September 27-28, 2013

Terminology

✓ is not a Specialized Lexicography

Linguistic	Specialized Vocabulary	Extra linguistic
	<p>"relaxation du ressort de maintien"</p> <p>"pastille B4C"</p>	
	<p>Terminology</p> <p>"crayon de combustible"</p> <p>"fluide réfrigérant"</p>	<p>Terminology</p> <p>"absorbant neutronique"</p> <p>"chimie du circuit primaire"</p>
	<p>"crayon de combustible usagé"</p> <p>"tige de commande"</p>	

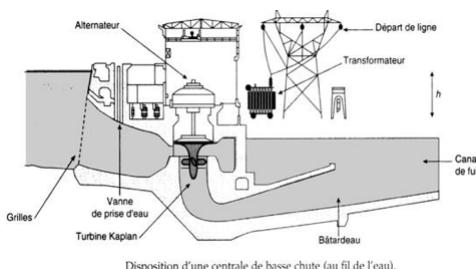
www.condillac.org – roche@univ-savoie.fr

11 © C. Roche

"Ontology: Re-Thinking Terminology" - Applications of Cognitive Terminological Theories in Terminology Management - Zagreb - September 27-28, 2013

Terminology

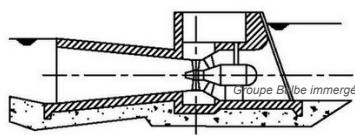
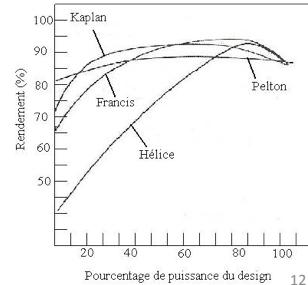
✓ There is no Terminology without Specialized Knowledge



Disposition d'une centrale de basse chute (au fil de l'eau).

$$n_s = \frac{\Omega \sqrt{P/\rho}}{g H^{5/4}}$$

n_s : vitesse spécifique
 Ω : vitesse angulaire (rad/s)
 P : puissance (kW)

Rendement (%)

Pourcentage de puissance du design

12 © C. Roche

www.condillac.org – roche@univ-savoie.fr

"Ontology: Re-Thinking Terminology" - Applications of Cognitive Terminological Theories in Terminology Management - Zagreb - September 27-28, 2013

Terminology

✓ There is no Terminology without Experts

www.condillac.org - roche@univ-savoie.fr

13
© C. Roche

"Ontology: Re-Thinking Terminology" - Applications of Cognitive Terminological Theories in Terminology Management - Zagreb - September 27-28, 2013

Terminology

☒ How to express Specialized Knowledge?

Natural Language

Technical and scientific texts

Ontologie

12-01. Conduites rivées et conduites soudées.
Les conduites en acier, initialement utilisées

1. La différence de 600 mètres cubes est réservée (voir ci-dessus) aux surcharges temporelles.

20

21

14
© C. Roche

"Ontology: Re-Thinking Terminology" - Applications of Cognitive Terminological Theories in Terminology Management - Zagreb - September 27-28, 2013

Terminology

☒ How to express Specialized Knowledge?

- Formal languages

$n_s = \frac{\Omega \sqrt{P/\rho}}{g H^{5/4}}$

n_s : vitesse spécifique
 Ω : vitesse angulaire (rad/s)
 P : puissance (kW)

Rendement (%)

Pourcentage de puissance du design

$$\vec{F}_{1 \rightarrow 2} = \frac{q_1 q_2}{4\pi \epsilon_0 \|\vec{r}_{12}\|^2} \cdot \frac{\vec{r}_{12}}{\|\vec{r}_{12}\|}$$

www.condillac.org – roche@univ-savoie.fr 15 © C. Roche

"Ontology: Re-Thinking Terminology" - Applications of Cognitive Terminological Theories in Terminology Management - Zagreb - September 27-28, 2013

Terminology

Relationship between natural language and formal languages?

Meta language

Deux charges électriques au repos placées dans le vide exercent l'une sur l'autre une force proportionnelle à leur charge et inversement proportionnelle au carré de leur distance. Force de répulsion lorsque les charges sont de même signe, et d'attraction dans le cas contraire, la formulation mathématique de cette loi dite loi de Coulomb est la suivante :

$$\vec{F}_{1 \rightarrow 2} = \frac{q_1 q_2}{4\pi \epsilon_0 \|\vec{r}_{12}\|^2} \cdot \frac{\vec{r}_{12}}{\|\vec{r}_{12}\|}$$

où q_1 et q_2 sont les charges situées aux points M_1 et M_2 , \vec{r}_{12} le vecteur reliant ces deux points et $F_{1 \rightarrow 2}$ la force exercée par la charge q_1 sur la charge q_2 .

Object language

www.condillac.org – roche@univ-savoie.fr 16 © C. Roche

"Ontology: Re-Thinking Terminology" - Applications of Cognitive Terminological Theories in Terminology Management - Zagreb - September 27-28, 2013

Terminology

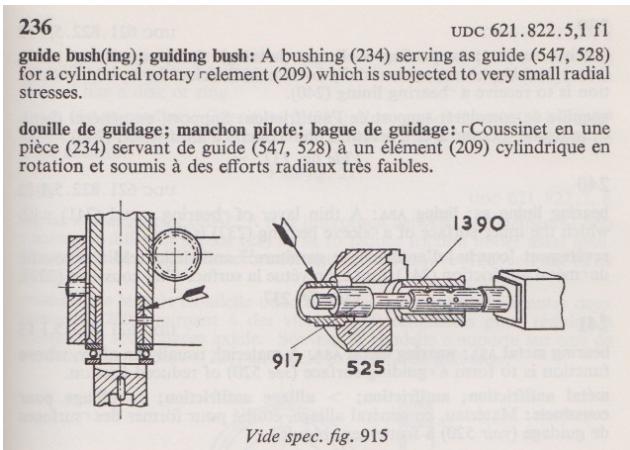
Relationship between natural language and formal languages?



"The Machine Tool: an Interlingual dictionary of basic concepts" E. Wüster

236 UDC 621 .822 .5,1 f1
guide bush(ing); guiding bush: A bushing (234) serving as guide (547, 528) for a cylindrical rotary element (209) which is subjected to very small radial stresses.

douille de guidage; manchon pilote; bague de guidage: Coussinet en une pièce (234) servant de guide (547, 528) à un élément (209) cylindrique en rotation et soumis à des efforts radiaux très faibles.



Vide spec. fig. 915

www.condillac.org – roche@univ-savoie.fr © C. Roche

"Ontology: Re-Thinking Terminology" - Applications of Cognitive Terminological Theories in Terminology Management - Zagreb - September 27-28, 2013

Terminology

Relationship between natural language and formal languages?



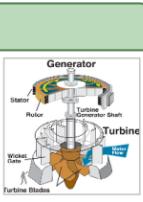
Multilingual specialized encyclopedias

OSTermino v1.07 - 05/01/2009
Hydraulic_Turbine_Domain - 07/06/2009 23:31:00
Equipe Condillac

Concept : <Hydraulic turbine>

Définition :
Composé de : <hydraulic wheel>, <Shaft>, <Water in>, <Water out>.
Elément de : <hydraulic group>.

Terme normalisé : hydraulic turbine,
Terme d'usage : turbine,



Terme d'usage : "turbine"

Signification : <hydraulic turbine>
Définition : Hydraulic machinery is an essential element in the conduction of a hydroelectric scheme. It is the first element that receives water from the river. It is a key element that must bring together topographical, hydrological, and technical characteristics of a hydroelectric scheme.

Synonymes : hydraulic turbine
Terme liée : hydraulic wheel, shaft, water in, water out, wheel

Informations :

www.condillac.org – roche@univ-savoie.fr © C. Roche

"Ontology: Re-Thinking Terminology" - Applications of Cognitive Terminological Theories in Terminology Management - Zagreb - September 27-28, 2013

Terminology

✓ a **Double Dimension**

term: *verbal designation of a general concept* [ISO 1087-1]

```

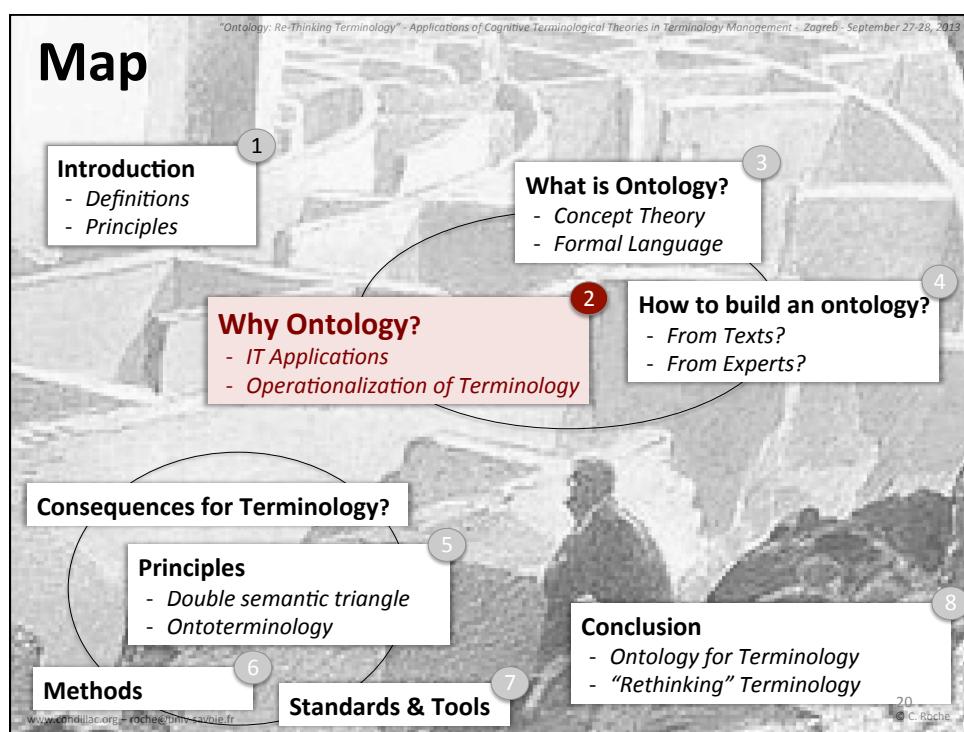
graph TD
    Terminology[Terminology] --> Linguistic[Linguistic]
    Terminology --> Conceptual[Conceptual]
    Linguistic <---- ? ----> Conceptual
  
```

✓ there is no Terminology without a **Theory of Concept**

✓ roots in **Linguistics, Theory of Knowledge, Logic & Computer Science**

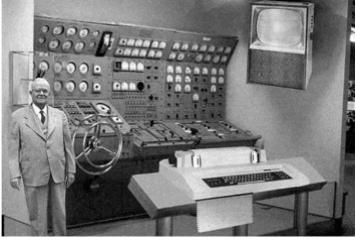
www.condillac.org - roche@univ-savoie.fr

19
© C. Roche



"Ontology: Re-Thinking Terminology" - Applications of Cognitive Terminological Theories in Terminology Management - Zagreb - September 27-28, 2013

IT Applications



- ✓ Semantic (Multilingual) Search Engine
- ✓ (Multilingual) Content Management Systems
- ✓ (Multilingual) Specialized Encyclopedias
- ✓ Knowledge Capitalization
- ✓ Semantic web

➡ Operationalization of Terminology

☞ Computational Representation of the Conceptual System

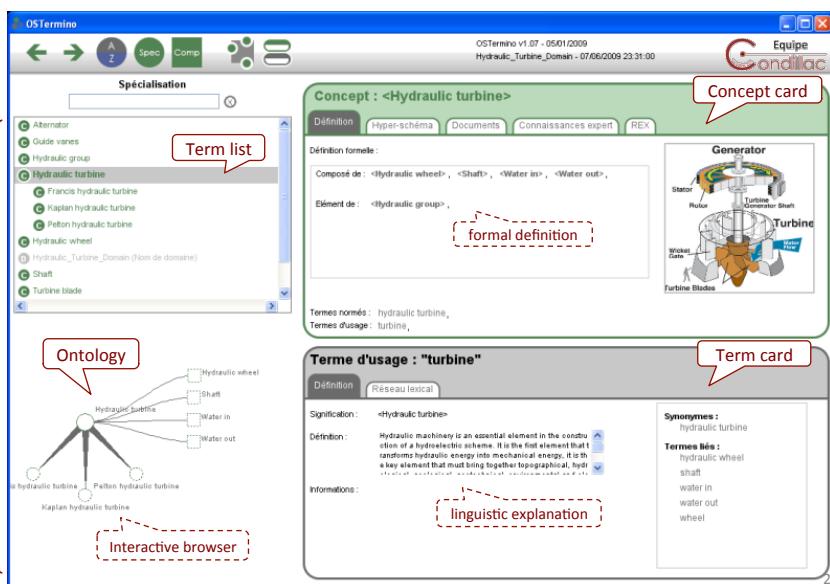
ONTOLOGY

www.condillac.org – roche@univ-savoie.fr 21 © C. Roche

"Ontology: Re-Thinking Terminology" - Applications of Cognitive Terminological Theories in Terminology Management - Zagreb - September 27-28, 2013

IT Applications

(multilingual) Specialized Encyclopedias



The screenshot shows the OSTermino application interface. On the left, there is an "Ontoterminalogy" section with a bracket pointing to an "Interactive browser" window displaying a network of terms like "Hydraulic turbine", "Francis hydraulic turbine", "Kaplan hydraulic turbine", etc., connected by arrows. A red box highlights the "Term list". On the right, there are two main windows: a "Concept card" for "Hydraulic turbine" which includes a diagram of a turbine with labels for "Generator", "Stator", "Rotor", "Turbine Generator Shaft", "Turbine", "Wicket Gate", and "Turbine Blades", along with a "formal definition"; and a "Term card" for "turbine" which includes a "linguistic explanation". Both windows have tabs for "Définition", "Hyper-schéma", "Documents", "Connaissances expert", and "REX". A red box highlights the "Concept card". A vertical bracket on the left is labeled "Ontoterminalogy".

www.condillac.org – roche@univ-savoie.fr 22 © C. Roche

"Ontology: Re-Thinking Terminology" - Applications of Cognitive Terminological Theories in Terminology Management - Zagreb - September 27-28, 2013

IT Applications

(Multilingual) Content Management System & Semantic Search Engine

The interface features a central circular diagram representing an ontology. Labels around the perimeter include: Exploration, Répartition, Texte, Ontotérminologie, Query in French, Mechanism and modeling of nitrogen chemistry in combustion, +75 places, English, Principles of heat transfer +2 places, English, and Introduction to combustion phenomena +89 places.

Ontotérminologie

Query in French

Mechanism and modeling of nitrogen chemistry in combustion
JA Miller, CT Bowman - Progress in Energy and Combustion Science, 1989 - Elsevier Our current understanding of the mechanisms and rate parameters for the gas-phase reactions of nitrogen compounds that are applicable to combustion-generated air pollution is discussed and illustrated by comparison of results from detailed kinetics calculations with ... Cited by 1434 - Related articles - All 4 versions
4 concept(s)

Principles of heat transfer +2 places
F Kreith, MS Bohn - 1986 - osti.gov The contents of this book include: Basic modes of **heat transfer**; Numerical analysis of heat **conduction**; Natural convection; Forced **convection** inside tubes and ducts; Heat exchangers; Heat transfer with change phase; and Special topics. Cited by 1482 - Related articles - Cached - All 10 versions
4 concept(s)

Introduction to combustion phenomena +89 places

www.condillac.org – roche@univ-savoie.fr

23 © C. Roche

"Ontology: Re-Thinking Terminology" - Applications of Cognitive Terminological Theories in Terminology Management - Zagreb - September 27-28, 2013

IT Applications

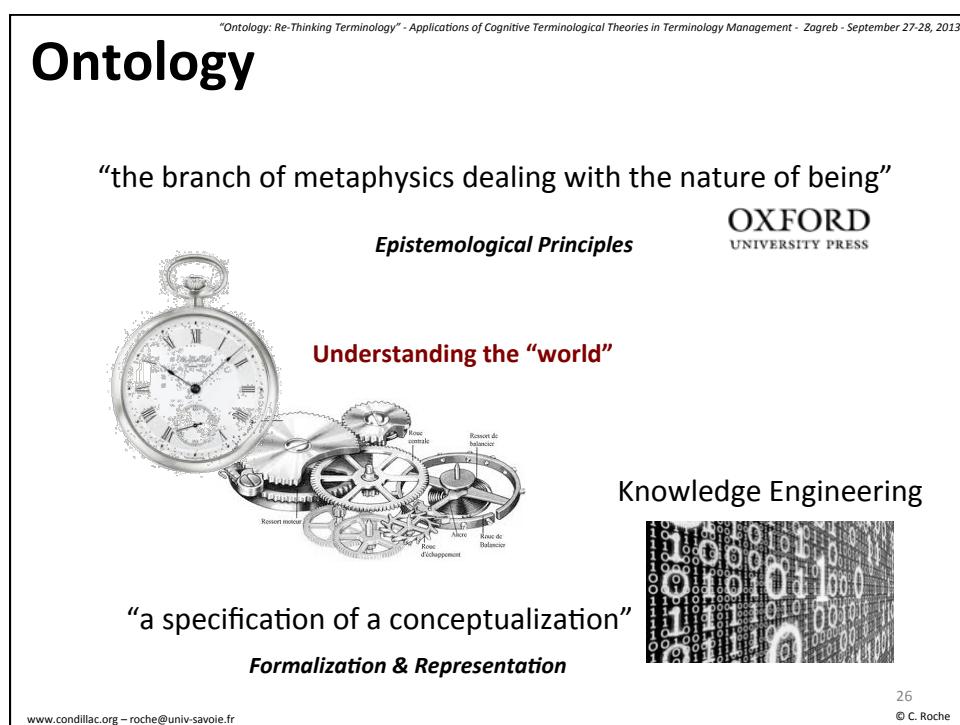
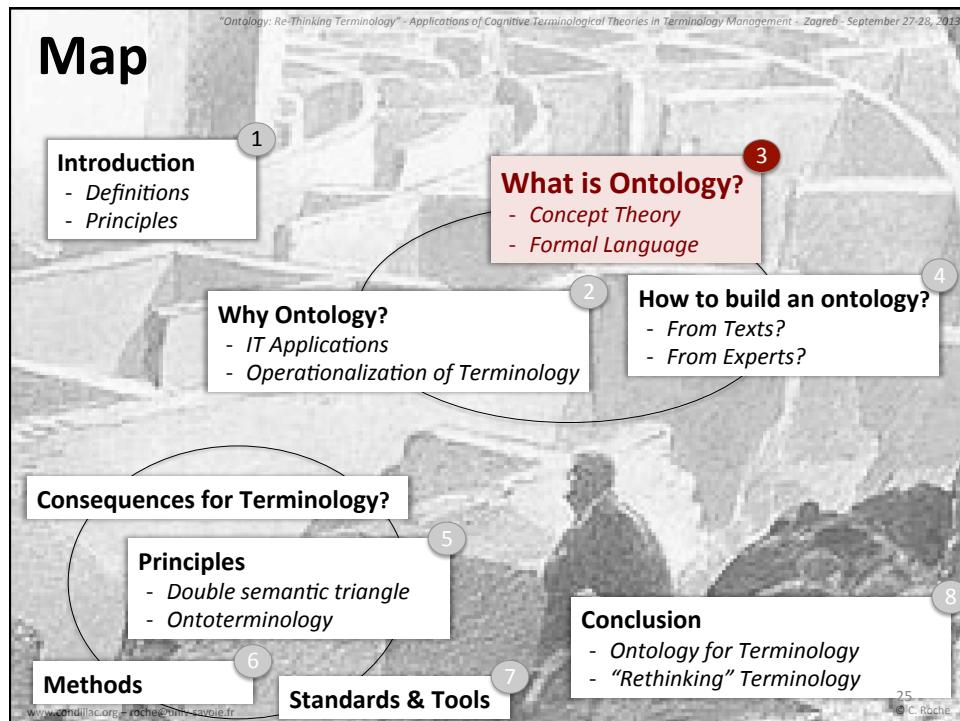
"Computational Representation of a Conceptual System"

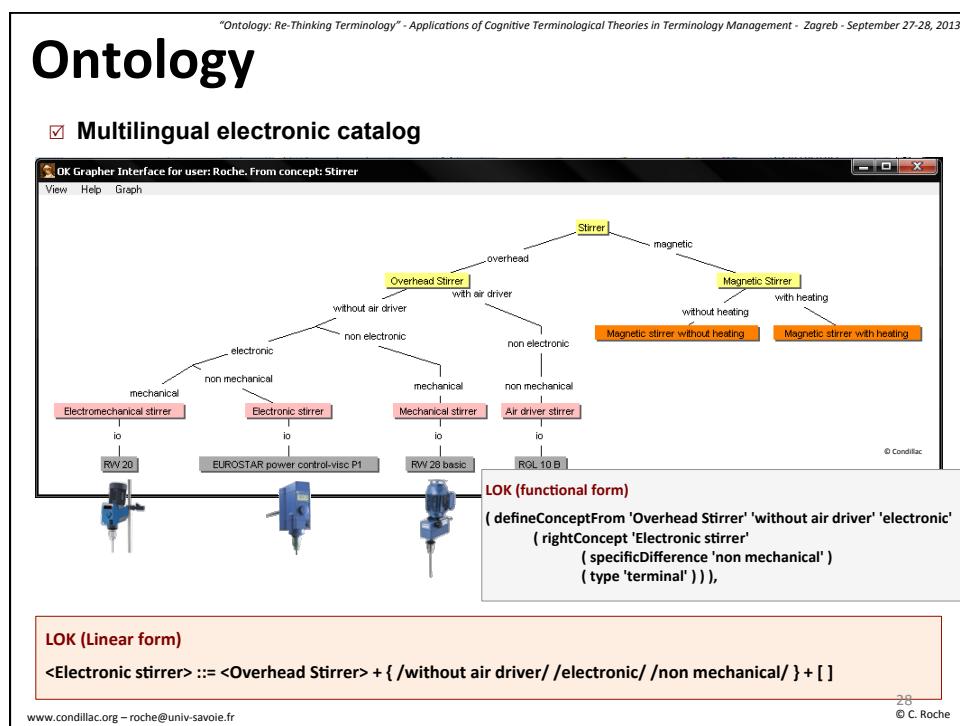
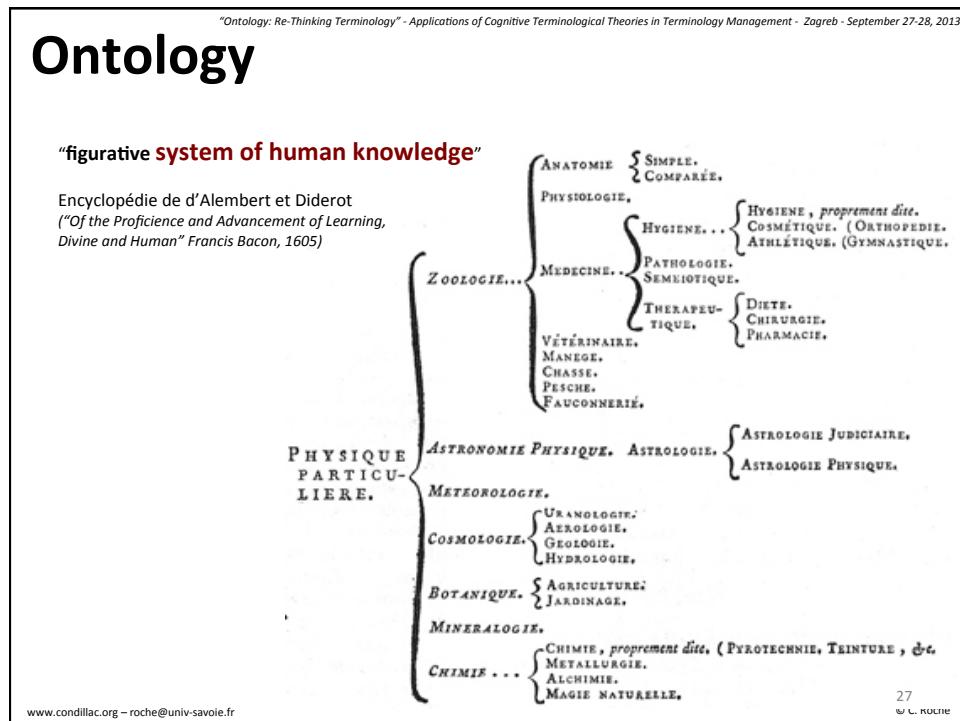
ONTOLOGY

from Knowledge Engineering

www.condillac.org – roche@univ-savoie.fr

24 © C. Roche





"Ontology: Re-Thinking Terminology" - Applications of Cognitive Terminological Theories in Terminology Management - Zagreb - September 27-28, 2013

Ontology

✓ A Theory of Concept

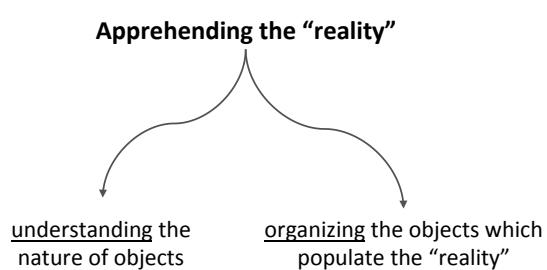
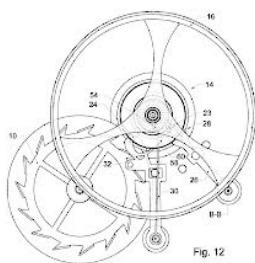
✓ A Language of Expression

www.condillac.org – roche@univ-savoie.fr

29
© C. Roche

"Ontology: Re-Thinking Terminology" - Applications of Cognitive Terminological Theories in Terminology Management - Zagreb - September 27-28, 2013

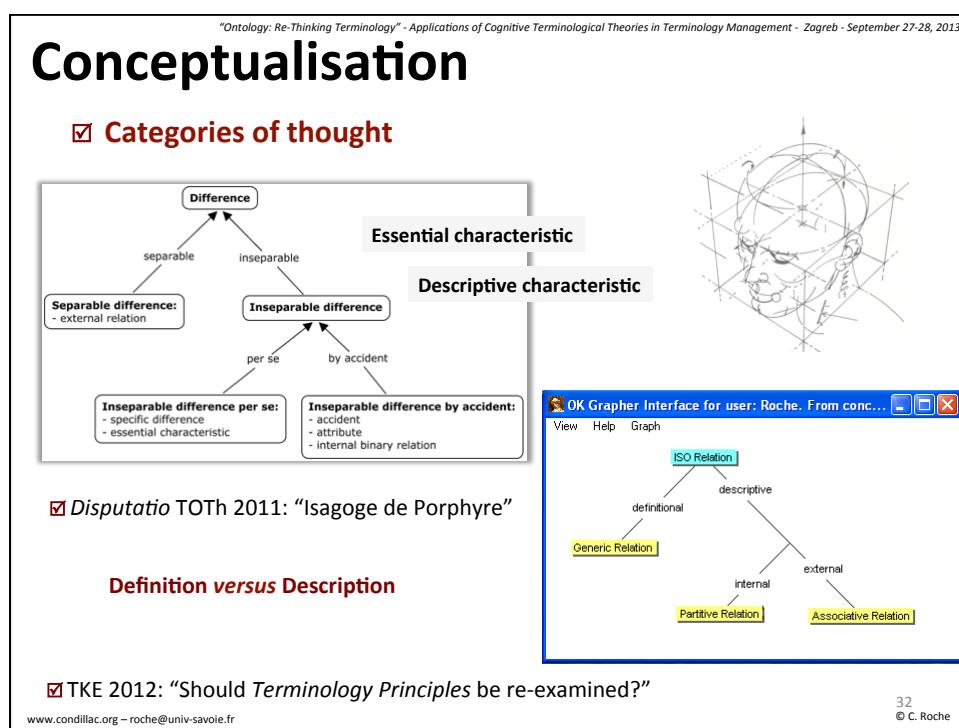
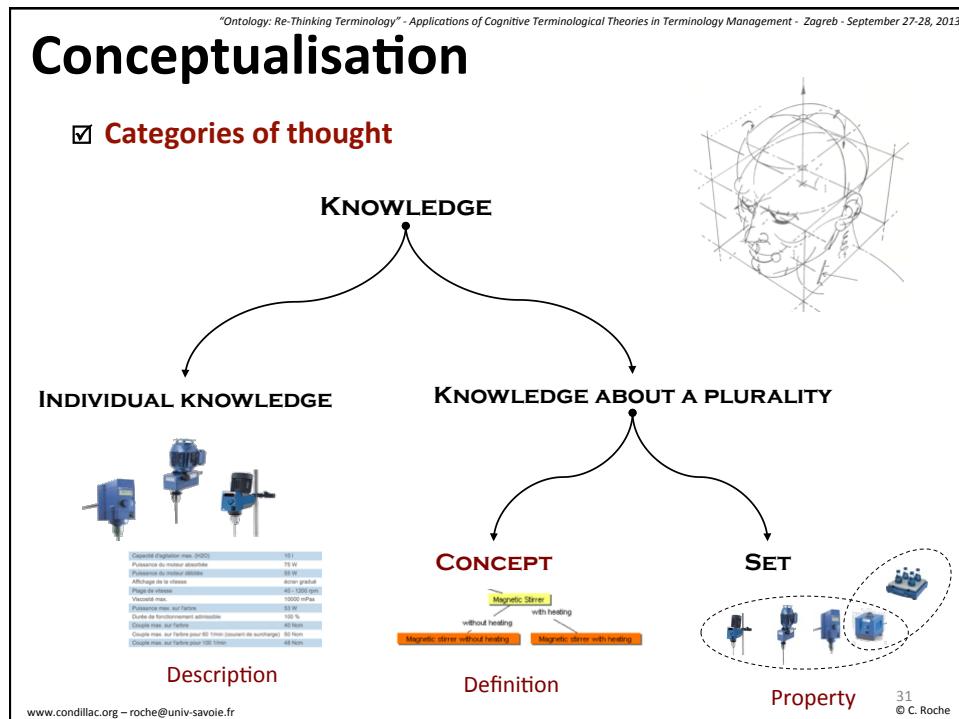
Conceptualisation



Concept : “unit of understanding”, “representation of an idea”,
“knowledge about a plurality of things”

www.condillac.org – roche@univ-savoie.fr

30
© C. Roche



"Ontology: Re-Thinking Terminology" - Applications of Cognitive Terminological Theories in Terminology Management - Zagreb - September 27-28, 2013

Languages



Formal Languages

⇒ Properties

- objective
- coherent
- precise
- consensual
- reusable
- sharable
- axiomatic system

www.condillac.org – roche@univ-savoie.fr

33
© C. Roche

"Ontology: Re-Thinking Terminology" - Applications of Cognitive Terminological Theories in Terminology Management - Zagreb - September 27-28, 2013

Languages

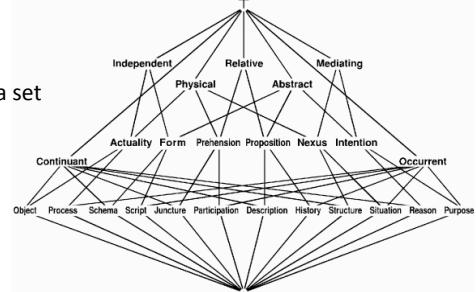
Logic-based languages

- clear and formal syntax and semantics
- sound inferences
- a concept is a well formed formula
- a concept is a definition by intension of a set
- operational languages

Properties :

- coherent
- precise
- can be shared
(interchange format)

⇒ **Logic is necessary**



A concept (category) is an unary predicate.
'form(x)' = independant(x) ∧ abstract(x)

www.condillac.org – roche@univ-savoie.fr

34
© C. Roche

"Ontology: Re-Thinking Terminology" - Applications of Cognitive Terminological Theories in Terminology Management - Zagreb - September 27-28, 2013

Languages

Frame-based languages

Artificial Intelligence: Frame System, Conceptual Graph, Semantic Network.

- a concept (class) is a set of slots
- concepts are organized into a hierarchy according to the « sub-class » relationship

Properties :

- human readable form
- can be shared
(interchange format)

```

graph TD
    MATERIAL --> LIQUID
    MATERIAL --> ELEMENT_MATERIAL[ELEMENT-MATERIAL]
    MATERIAL --> SOLID
    MATERIAL --> METAL
    MATERIAL --> ALLOY
    ELEMENT_MATERIAL --> LIQUID_ELEMENT[LIQUID-ELEMENT]
    ELEMENT_MATERIAL --> CHEMICAL_COMPOUND[CHEMICAL-COMPOND]
    CHEMICAL_COMPOUND --> SOLID_CHEMICAL_COMPOUND[SOLID-CHEMICAL-COMPOND]
    SOLID --> SOLID_ELEMENT[SOLID-ELEMENT]
    SOLID --> METALLIC_LIQUID_E[METALLIC-LIQUID-E]
    SOLID_ELEMENT --> METALLIC_LIQUID_E
    METAL --> ALLOY
    
```

class-def voltage-relay
subclass-of relay
slot-constraint threshold
has-filler voltage

www.condillac.org – roche@univ-savoie.fr 35 © C. Roche

"Ontology: Re-Thinking Terminology" - Applications of Cognitive Terminological Theories in Terminology Management - Zagreb - September 27-28, 2013

Languages

Dedicated Languages

OK Grapher Interface for user: Roche. From concept: Stirrer

Multilingual electronic catalog

Stirrer

Overhead Stirrer

Magnetic Stirrer

Electromechanical stirrer

Electronic stirrer

Mechanical stirrer

Air driver stirrer

RW 20

EUROSTAR power control-visc P1

RW 28 basic

RGL 10 B

LOK (functional form)

```

(defineConceptFrom 'Overhead Stirrer' 'without air driver' 'electronic'
  (rightConcept 'Electronic stirrer'
    (specificDifference 'non mechanical')
    (type 'terminal'))),
  
```

Aristotelian principles

LOK (Linear form)

```

<Electronic stirrer> ::= <Overhead Stirrer> + { /without air driver/ /electronic/ /non mechanical/ } + []
  
```

www.condillac.org – roche@univ-savoie.fr 36 © C. Roche

"Ontology: Re-Thinking Terminology" - Applications of Cognitive Terminological Theories in Terminology Management - Zagreb - September 27-28, 2013

Languages

Open Issues

The "knowledge-language" problem

Which « Language – Theory » to choose?

Object

Formal Language

Theory

Subject

Intention

© C.Roche – roche@univ-savoie.fr ICEIS 2003

www.condillac.org – roche@univ-savoie.fr

37
© C. Roche

"Ontology: Re-Thinking Terminology" - Applications of Cognitive Terminological Theories in Terminology Management - Zagreb - September 27-28, 2013

Map

1 **Introduction**
- Definitions
- Principles

2 **Why Ontology?**
- IT Applications
- Operationalization of Terminology

3 **What is Ontology?**
- Concept Theory
- Formal Language

4 **How to build an ontology?**
- From Texts?
- From Experts?

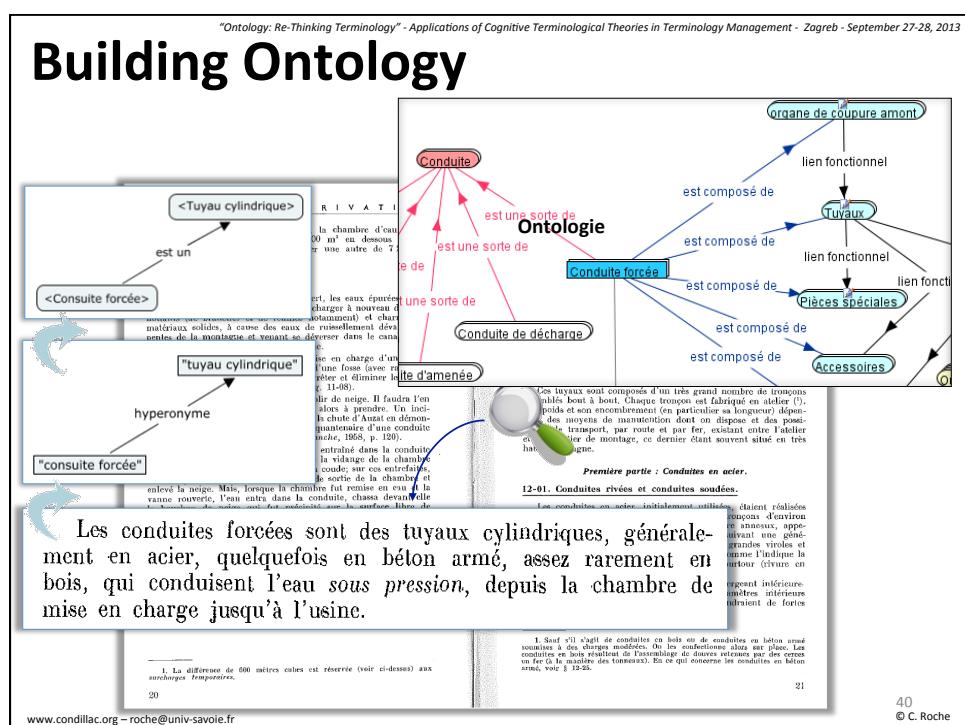
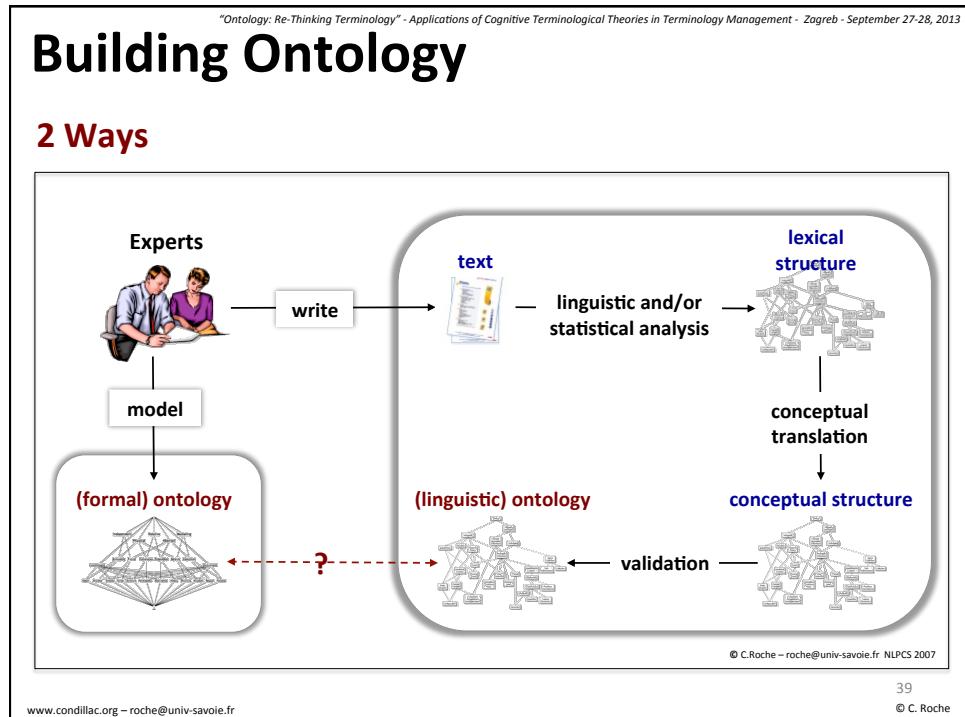
5 **Consequences for Terminology?**
- Principles
- Double semantic triangle
- Ontoterminology

6 **Methods**

7 **Standards & Tools**

8 **Conclusion**
- Ontology for Terminology
- "Rethinking" Terminology

38
© C. Roche



"Ontology: Re-Thinking Terminology" - Applications of Cognitive Terminological Theories in Terminology Management - Zagreb - September 27-28, 2013

Building Ontology

The diagram illustrates the building of an ontology for relays. It features three relay components (voltage relay, threshold relay, electromagnetic relay) and two workers reviewing blueprints. A conceptual hierarchy diagram shows "relay" as the root node, with "voltage relay", "threshold relay", and "electromagnetic relay" as hyponyms. The "threshold relay" is further divided into "Power threshold relay" and "Voltage threshold relay".

```

graph TD
    relay["relay"]
    voltageRelay["voltage relay"]
    thresholdRelay["threshold relay"]
    electromagneticRelay["electromagnetic relay"]

    relay -- hyponym --> voltageRelay
    relay -- hyponym --> thresholdRelay
    relay -- hyponym --> electromagneticRelay

    thresholdRelay -- hyponym --> powerRelay["Power threshold relay"]
    thresholdRelay -- hyponym --> voltageRelay["Voltage threshold relay"]
  
```

.....
..... voltage relay
..... threshold relay
..... electromagnetic relay ...

www.condillac.org – roche@univ-savoie.fr

41
© C. Roche

"Ontology: Re-Thinking Terminology" - Applications of Cognitive Terminological Theories in Terminology Management - Zagreb - September 27-28, 2013

Building Ontology

The diagram illustrates the building of an ontology for water turbines. It shows a dam, a Kaplan turbine diagram, and a conceptual hierarchy diagram. The hierarchy shows "Propeller Turbine" as a type of "Kaplan Turbine".

```

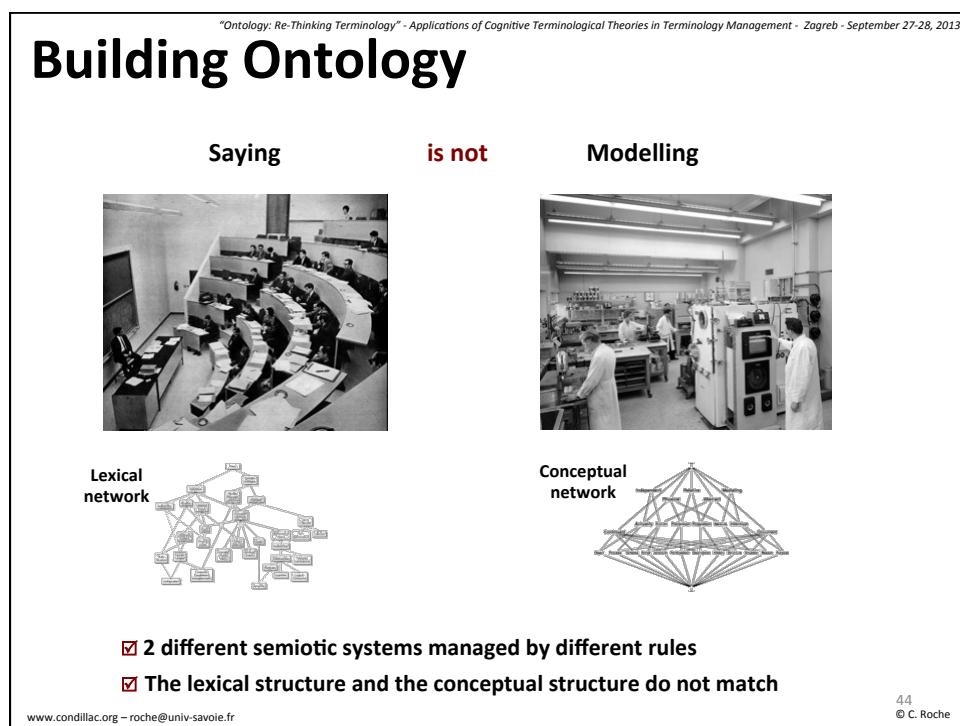
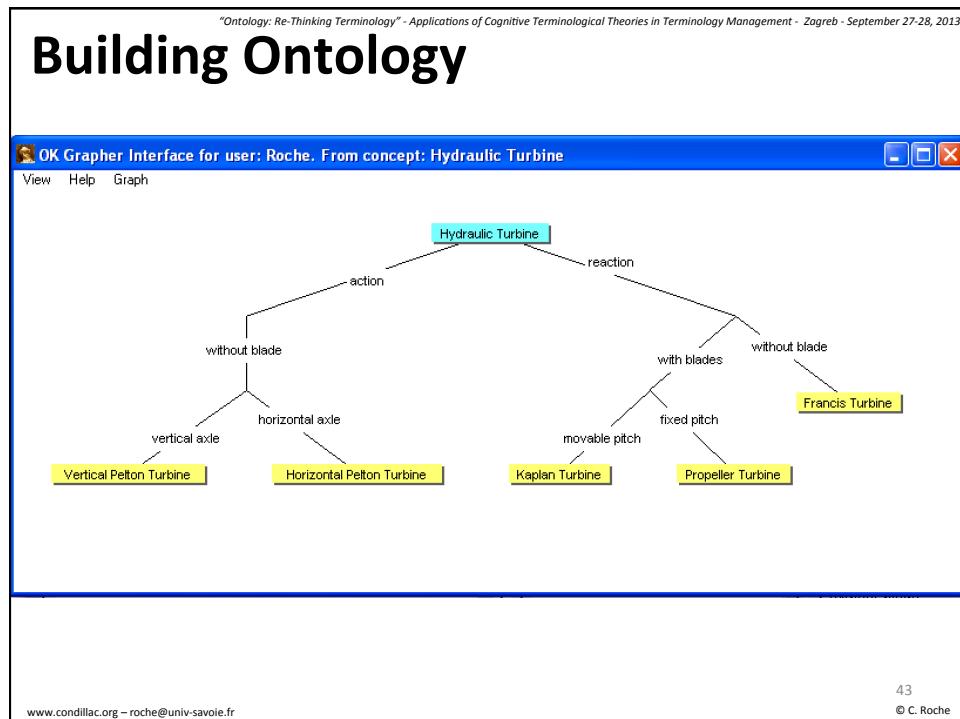
graph TD
    propellerTurbine["Propeller Turbine"]
    kaplanTurbine["Kaplan Turbine"]

    propellerTurbine -- is a --> kaplanTurbine
  
```

....
... The three main types of water turbines are Pelton wheels, Francis turbines, and Kaplan or propeller type turbines....
....
... A Kaplan turbine is a propeller turbine in which the pitch of the blades can be changed to improve performance....
....
... A propeller turbine is a Kaplan turbine with fixed blades...
....
... A Kaplan turbine looks like a propeller turbine...

Turbine PELTON
Q [m³/s]: 100 - 1500
H [m]: 100 - 1000
V [W]: 100000 - 1000000

42
© C. Roche



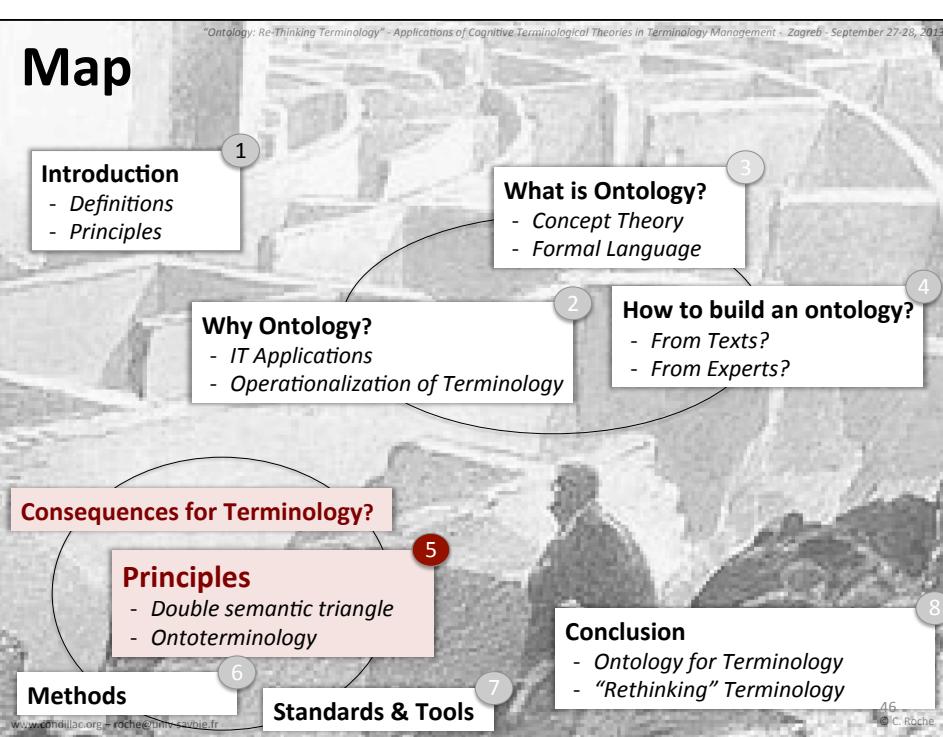
Building Ontology

"If a conceptualisation can be said in natural language, it is defined in a formal language guided by epistemological principles"



Don't confuse knowledge with discourse about knowledge

Map



"Ontology: Re-Thinking Terminology" - Applications of Cognitive Terminological Theories in Terminology Management - Zagreb - September 27-28, 2013

Terminology versus Ontology

- An Ontology is not a Terminology
- A Terminology is not an Ontology

} Share the "same" goals

✓ **Ontology is useful**

→ ☑ **Termontography:**

« capture and represent knowledge acquired from **texts** »
 « **terms** (linguistic expressions) in texts became the starting point in terminological analysis »

✓ **Ontology defines a new approach of the terminological work**

→ ☑ **Ontoterminology:**

« capture and represent knowledge acquired from **experts** »
 « **concepts** (formally defined) in expert knowledge became the starting point in terminological analysis »

www.condillac.org – roche@univ-savoie.fr

47
© C. Roche

"Ontology: Re-Thinking Terminology" - Applications of Cognitive Terminological Theories in Terminology Management - Zagreb - September 27-28, 2013

Principles

- ☒ **2 dimensions: Conceptual and Linguistic**
- ☒ **A concept is language-independent**

A term in discourse is used as a word and then has a signified

⇒ **A signified is not a concept**



```

graph TD
    Denomination[Denomination] -- "linguistic" --> Term[Term]
    Denomination -- "non-linguistic" --> Identifier[Identifier]
  
```

⇒ **A term (designation, signifier) is a linguistic denomination of a concept**

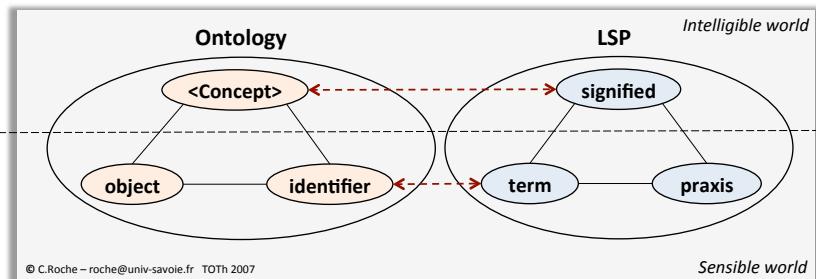
⇒ **An identifier is a non-linguistic denomination of a concept**

www.condillac.org – roche@univ-savoie.fr

48
© C. Roche

Principles

A double semantic triangle



www.condillac.org – roche@univ-savoie.fr

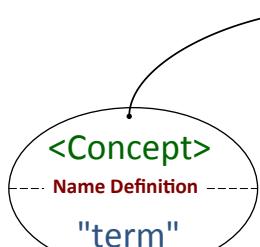
49
© C. Roche

Principles

Ontoterm

Thing Definition

- ontological: formal and constructive
- operational - reasoning



Term Definition

- linguistic explanation
- connotative information

www.condillac.org – roche@univ-savoie.fr

50
© C. Roche

"Ontology: Re-Thinking Terminology" - Applications of Cognitive Terminological Theories in Terminology Management - Zagreb - September 27-28, 2013

Ontoterminalogy

The diagram illustrates the concept of Ontoterminalogy. It starts with the word "Terminology" in red. A bracket labeled "2 dimensions" branches out to two arrows: one pointing right labeled "linguistic" and another pointing right labeled "conceptual". A magnifying glass icon is positioned next to the "conceptual" arrow.

"An **ontoterminalogy** is a terminology whose concept system is a **formal ontology**. It distinguishes and links the **2 linguistic and conceptual dimensions** of terminology

It emphasises the importance of the **epistemological** principles governing field conceptualisation – this is the primary definition of ontology.

It also emphasises the necessity of a **scientific approach** to terminology where the expert plays a key role – it involves ontology in its latest definitions where logic and knowledge representation languages are dominant factors.

And lastly, it connects **terms** (of usage and standardised) to **concepts**, while distinguishing the term **definitions in natural language** (linguistic explanations) from concepts' **formal definitions** (logical specifications, **constructive definitions**).

www.condillac.org – roche@univ-savoie.fr 51 © C. Roche

"Ontology: Re-Thinking Terminology" - Applications of Cognitive Terminological Theories in Terminology Management - Zagreb - September 27-28, 2013

Ontoterminalogy

✓ **Extra-linguistic representation of the conceptual system**

The diagram shows three separate semantic networks, each with nodes and connecting lines, arranged in a triangular pattern. Arrows point from the left and right networks towards a central network at the bottom. Above the central network, there is a large, complex web of lines connecting various nodes, representing a formal ontology. Labels on the left side of the diagram include "- multilingualism" and "- linguistic diversity".

⇒ bi-univocity is not mandatory

www.condillac.org – roche@univ-savoie.fr 52 © C. Roche

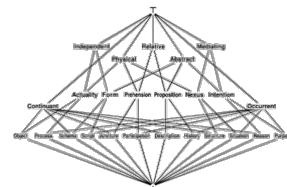
"Ontology: Re-Thinking Terminology" - Applications of Cognitive Terminological Theories in Terminology Management - Zagreb - September 27-28, 2013

Ontoterminalogy

✓ Computational representation

➡ Operationalization of terminology

- computer aided translation
- (multilingual) specialized dictionaries
- knowledge capitalisation
- knowledge mapping
- e-learning
- semantic web
- (multilingual) content management systems
- information retrieval (semantic search engine)



www.condillac.org – roche@univ-savoie.fr

53
© C. Roche

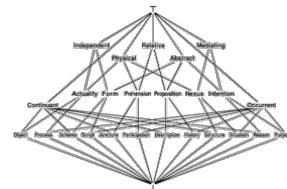
"Ontology: Re-Thinking Terminology" - Applications of Cognitive Terminological Theories in Terminology Management - Zagreb - September 27-28, 2013

Ontoterminalogy

✓ Formal representation

➡ Properties

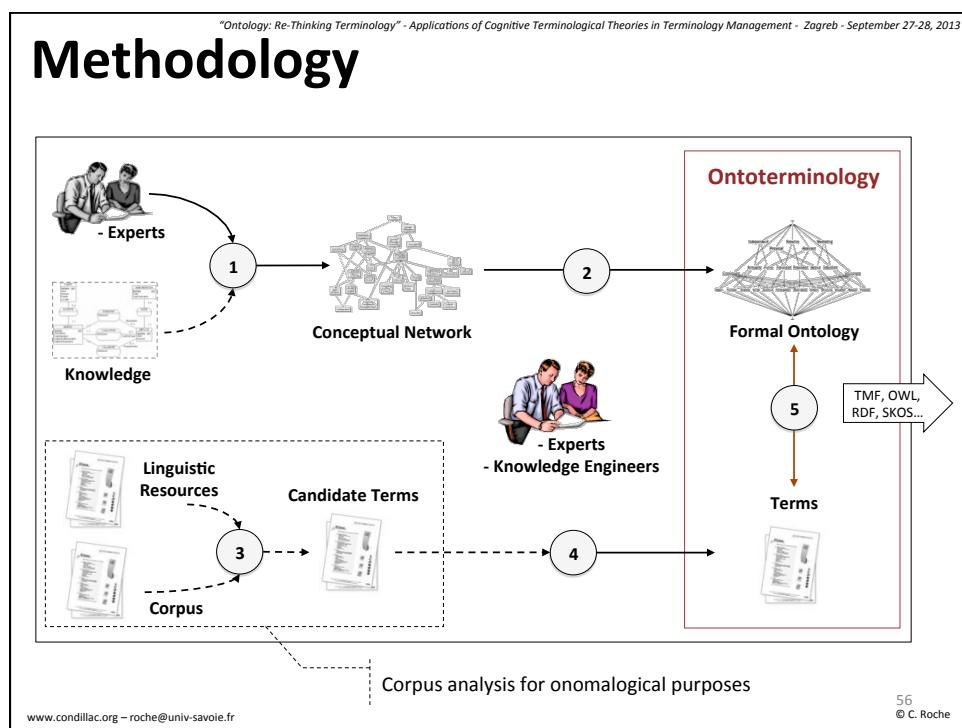
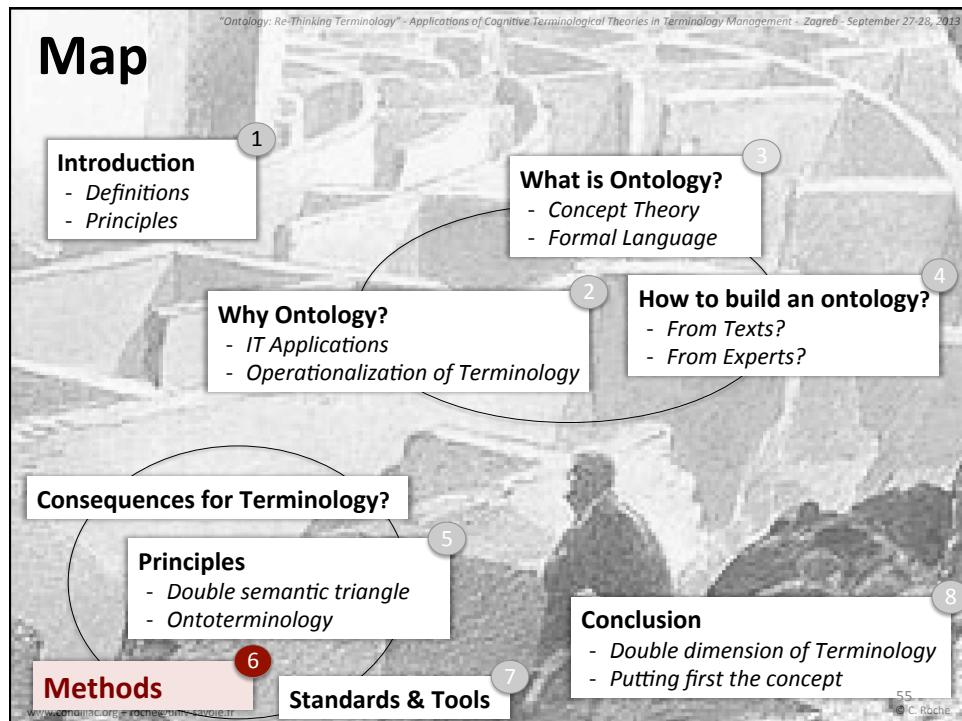
- coherent
- precise
- consensual
- reusable
- sharable

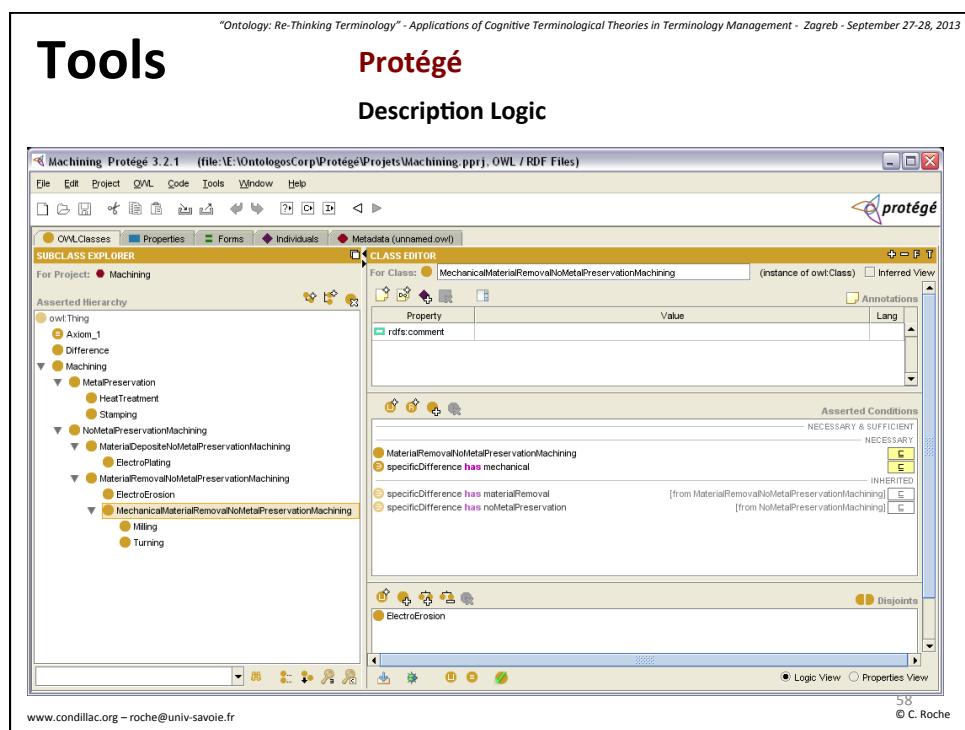
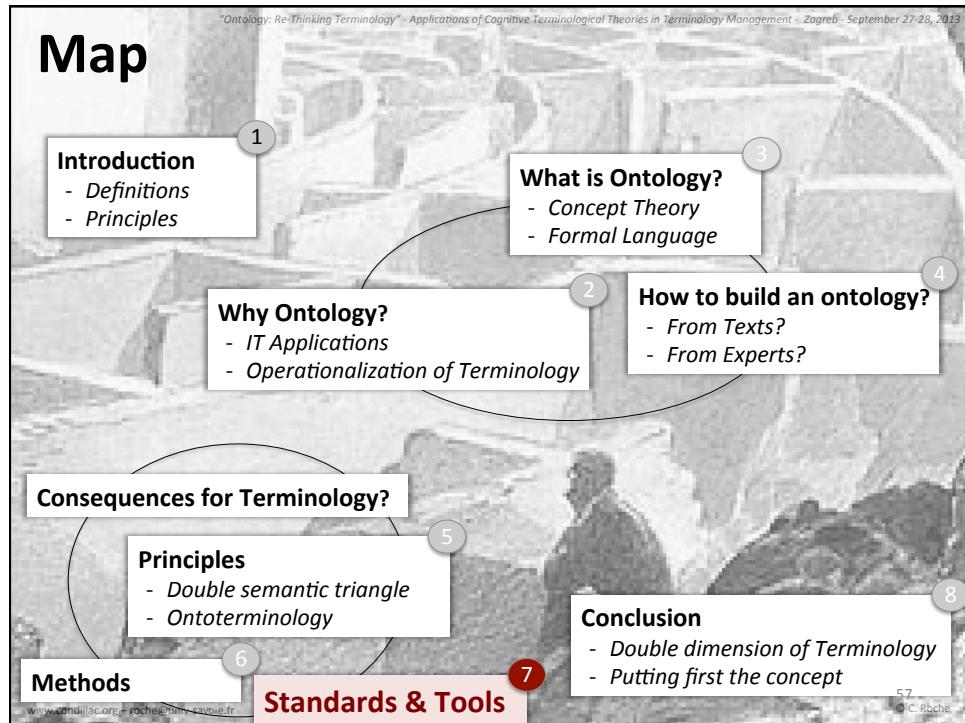


$$\text{form}(x) = \text{independant}(x) \wedge \text{abstract}(x)$$

www.condillac.org – roche@univ-savoie.fr

54
© C. Roche





"Ontology: Re-Thinking Terminology" - Applications of Cognitive Terminological Theories in Terminology Management - Zagreb - September 27-28, 2013

Tools

Ontology Craft Workbench

Aristotelian Specific Difference Principle

The screenshot displays the Ontology Craft Workbench interface. The left window, titled 'OK Interface for user: Roche on ontology: usinages.ont', shows a 'Concept & Class Hierarchy' tree. The root node 'Usinage' has several children: 'Alésage', 'Electro-déposition', 'Electro-érosion', 'Estampage', 'Fraisage', and 'Tournage'. The 'Tournage' node is currently selected. The right window, titled 'OK Grapher Interface for user: Roche. From concept: Usinage', shows a detailed graph of the 'Usinage' concept. The graph branches into 'non conservation de matière' (non-conservation of matter) and 'conservation de matière' (matter conservation). 'non conservation de matière' leads to 'enlèvement de matière' (removal of matter), which further branches into 'mécanique' (mechanical) leading to 'rotation de l'outil' (tool rotation) and 'déplacement colinéaire' (collinear movement); and 'électro-chimique' (electro-chemical) leading to 'Electro-érosion'. 'conservation de matière' leads to 'dépôt de matière' (deposition of matter), which branches into 'électro-chimique' (electro-chemical) leading to 'Usinage chimique' and 'Electro-déposition', and 'électrique' (electric) leading to 'Tratment Thermique' and 'déformation mécanique' (mechanical deformation).

"Ontology: Re-Thinking Terminology" - Applications of Cognitive Terminological Theories in Terminology Management - Zagreb - September 27-28, 2013

Should ISO's Conceptual Principles be Re-Examined?

ISO/TC 37
Terminology and other language and content resources

ISO 704 & ISO 1087-1

Pretoria 10-14 June 2013

Pr. Christophe Roche
Condillac Research Group « Terminology and Ontology »
University of Savoie - France

roche@univ-savoie.fr - www.condillac.org

60
© C. Roche

Zagreb - September 27-28, 2013

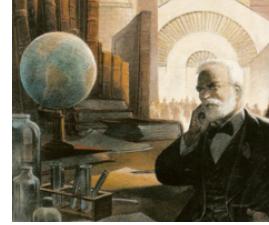
■ Individual Concept & Concept

ISO

- ✓ No individual
- ✓ Individual concept which corresponds to only one object
 - Canada is an individual concept
- ✓ General concept which corresponds to two or more objects

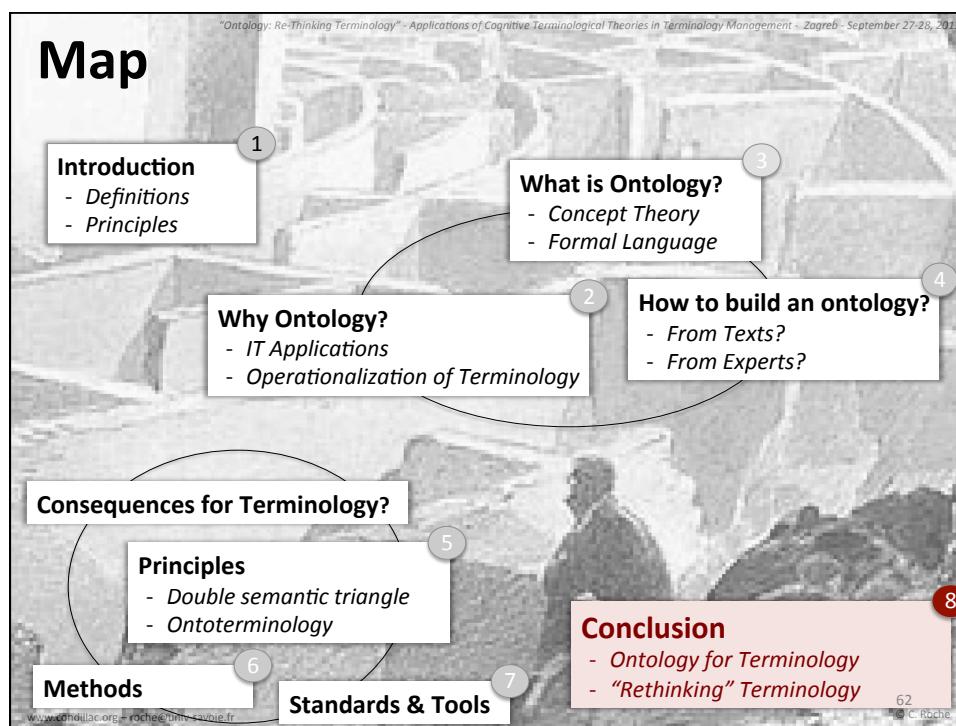
Epistemology point of view

- Individual
- The definition of a concept does not depend on the cardinality of its extension (1, 2, more, or even 0)
- An individual is a subject for predicate not a predicate
 - x is a Canada
 - "to be is to be the value of a variable"
- An individual remains itself in essence in spite of its possible variations in quality



www.condillac.org – roche@univ-savoie.fr

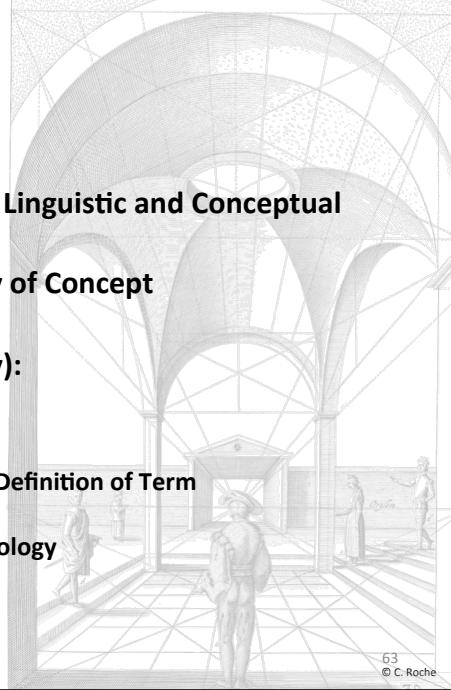
61
© C. Roche



"Ontology: Re-Thinking Terminology" - Applications of Cognitive Terminological Theories in Terminology Management - Zagreb - September 27-28, 2013

Conclusion

- ✓ Which Terminology for What?
- ✓ 2 non-isomorphic Dimensions: Linguistic and Conceptual
- ✓ Terminology relies on a Theory of Concept
- ✓ Putting first Concept (Ontology):
 - ➡ "Rethinking" Terminology:
 - Definition of Concept *versus* Definition of Term
 - Linguistic Diversity
 - Operationalization of Terminology
 - ⇒ Ontoterminalogy



www.condillac.org – roche@univ-savoie.fr

63
© C. Roche