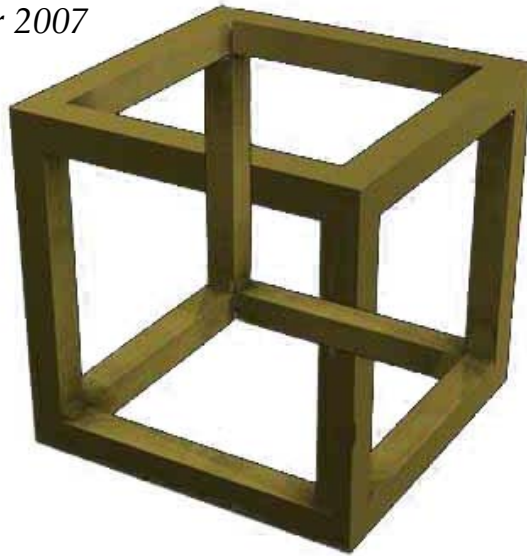# Four views of computing:
## disciplinary, cultural, philosophical & historical

*Perspectives on computing,*
*Warwick University,*
*2 November 2007*

Willard McCarty, Professor of Humanities Computing,
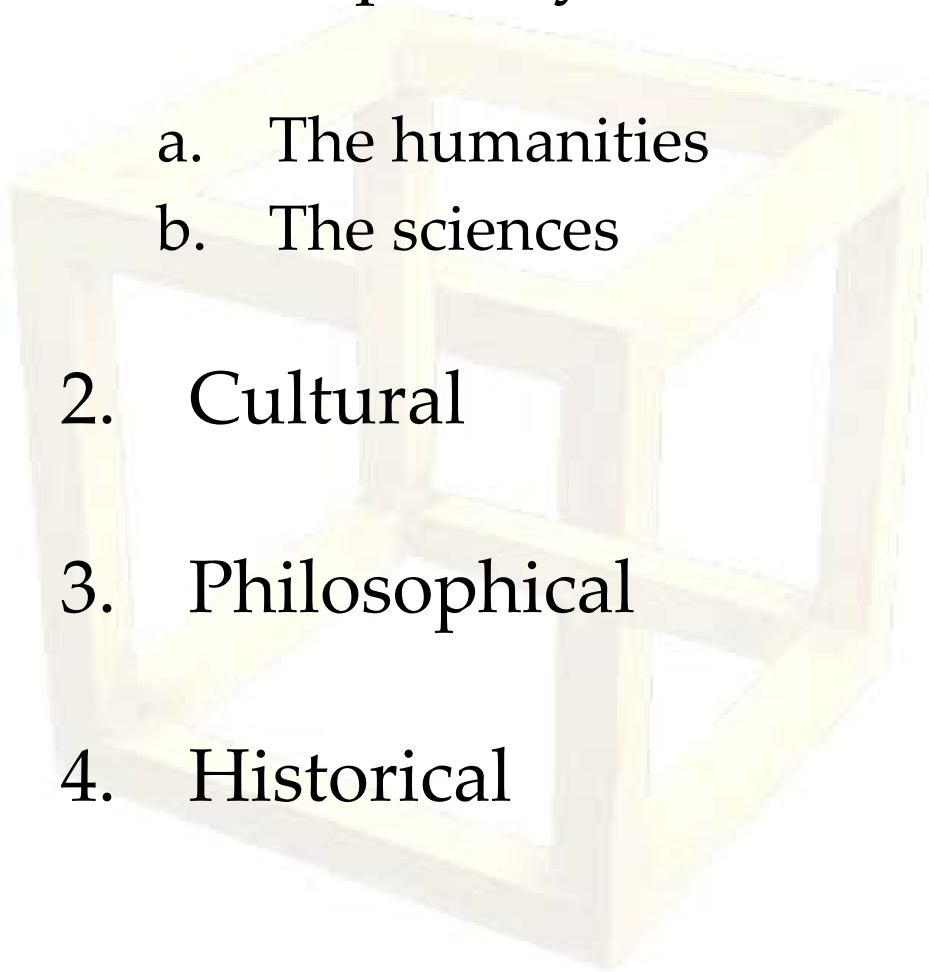King's College London, staff.cch.kcl.ac.uk/~wmccarty/

# Perspectives

1. Disciplinary

   a. The humanities
   b. The sciences

2. Cultural

3. Philosophical

4. Historical

# 1. Disciplinary

1.  Origins of computing in a mathematico-philosophical problem, thus involving both sides of the two-cultured divide;

2.  What was new: convergence with practical action → the methodological/bureaucratic machine;

3.  Nearly coeval applications in the sciences and the humanities;

4.  Different paths of development in part a function of differing trajectories of the sciences and humanities;

5.  Hence as an historiographical & philosophical orientation to the disciplinary question, we need to be able to characterize the divide.

# 1. Disciplinary

♦ Sciences vs humanities

1. *Nomothetic* vs *idiographic*
   (Wilhelm Windelband, philosopher, 1848-1915);

2. *Logical* vs *psychological*
   (Hermann von Helmholtz, physicist, 1821-1894);

3. *Detached* vs *involved*
   (Carlo Ginsberg, historian, 1939-);

4. *Distant* vs *up close*
   (Clifford Geertz, anthropologist, 1926-2006);

5. *Singular* vs *plural*
   (Jerome Bruner, psychologist, 1915-).

# 1. Disciplinary

1.  *Nomothetic* vs *idiographic* (Windleband)

♦ *Nomothetic* (Gk, *nomothetikós*, "relating to legislation"): relating to or concerned with the study or discovery of the general laws underlying something.

♦ *Idiographic* (Gk, ídio-, "own, personal, peculiar, separate, distinct"; -*graphikós* "concerned with description"): relating to or concerned with the study or description of individually distinct entities.

"Rectorial Address, Strasbourg, 1894", *History and Theory* 19.2 (1980): 169-85.

# 1. Disciplinary

2. *Logical* vs *psychological* (Helmholtz)

♦ "The natural sciences are for the most part in a position to reduce their inductions to sharply defined general rules and principles; the moral sciences, on the other hand, have, in by far the most numerous cases, to do with conclusions arrived at by psychological instinct."

1862, trans. "On the Relation of Natural Science to Science in General", Science and Culture: Popular and Philosophical Essays, Chicago, 1995, p. 82.

# 1. Disciplinary

♦ *Detached* vs *involved* (Ginzburg)

  ♦ When Galilean science entered the picture "two roads were open: either sacrifice knowledge of the individual element for generalizations… or attempt to develop, even if tentatively, a different paradigm, founded on scientific knowledge of the individual…. The first course was taken by the natural sciences, and only much later by the so-called humane sciences. The reason for this is clear. *The tendency to obliterate the individual traits of an object is directly proportional to the emotional distance of the observer.*"

   "Clues: Roots of an Evidential Paradigm" (1986/1989): 112, my emphasis.

# 1. Disciplinary

♦ *Distant* vs *close* (Geertz)

   ♦ "by then perhaps a thousand years old, [it] still had a sharpness of definition extraordinary even for Morocco, where everything seems outlined in calcium light…. The town, the oasis, the mountains, each enclosed within the next, chalk white, olive green, stone brown, each marked off from the next by a line so sharp as to seem drawn with a pen, gave a sense of deliberate arrangement. Site and settlement looked equally designed. The initial effect of going on then to descend into the body of the town was, for a foreigner anyway, the total, instantaneous, and, so it seemed for an uncomfortable period, permanent dissolution of this sense of clarity, poise, and composition…. The double image, clarity from a distance, jumble up close set a frame of perception and understanding, a Jamesian hum of buzz and implication, that could not afterward be wholly discarded, only critiqued, developed, filled out, moralized upon, and brought to bear on more exact experiences."

   "Towns", in *After the Fact* (1995: 11f)

# 1. Disciplinary

♦ *Singular* vs *plural* (Bruner)

♦ "Science attempts to make a world that remains invariant across human intentions and human plights…. The humanities seek to understand the world as it reflects the requirements of living in it…. The one, science, is oriented outward to an external world; the other, inward toward a perspective and a point of view toward the world." Both "are constrained in the kinds of hypotheses they generate", the one by testability in physical experiment, the other by the condition "that they be recognizable as 'true to conceivable experience': that they have verisimilitude…. For the object of understanding human events is to sense *the alternativeness of human possibility.*"

"Possible Castles", in *Actual Minds, Possible Worlds* (1986): 50-3, my emphasis.

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# 1. Disciplinary

♦ Sciences vs humanities

♦ Nomothetic vs idiographic;

♦ Logical vs psychological;

♦ Detached vs engaged;

♦ Distant vs close;

♦ Singular vs plural.

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# 1. Disciplinary

♦ But where does computing fit in?

  ♦ Distinguish "computing" (*the action, activity or practice of using a computer*) from "computation" (*the science of the computable*);

  ♦ Define "computing" as a convenient onomastic tag for the plurality of *computings* rather than as the name for a common process.

♦ Computing fits in *everywhere,* but everywhere it fits it's a different computing!

# 1. Disciplinary

♦ *The perspective from the humanities*:

  ♦ **Descriptive**. What sort of computings do our best theories and practices require in order to study the artefacts?

  ♦ **Analytical**. How do the anomalies left by computational modelling illumine our unknown ways of knowing what we know?

  ♦ **Synthetic**. How can we model for an artefactual "inner standing point" so that we can understand our encounters with cultural artefacts?

# 1. Disciplinary

♦ *The perspective from the sciences*:

♦ **Descriptive**. What sort of computings are required by theoretical and experimental work?

♦ **Analytical**. How can theories be rendered as algorithms in order to illumine regularities in the data?

♦ **Synthetic**. How can we simulate unreachable or unobservable phenomena in order to study them?

# Perspectives

1. Disciplinary

   a. The humanities
   b. The sciences

2. **Cultural**

3. Philosophical

4. Historical
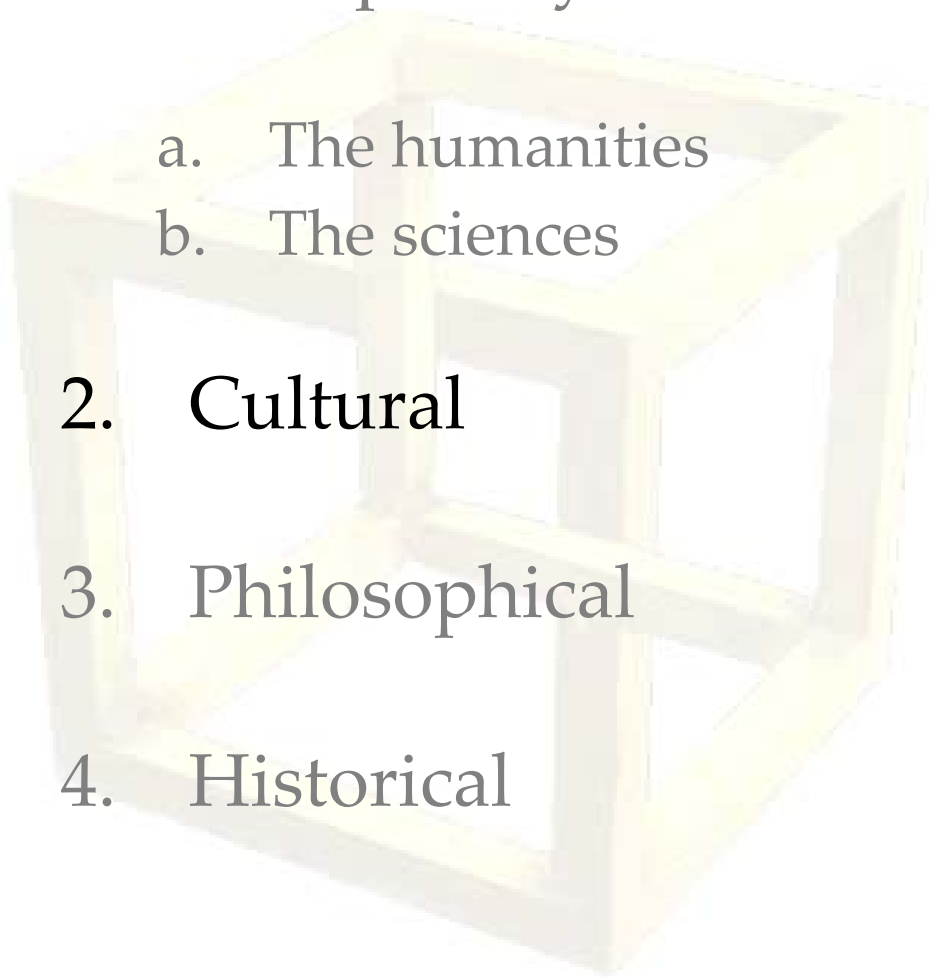
# 2. Cultural

♦ "Culture is ordinary" (Raymond Williams, 1958);

♦ Computing is manifold and (nearly) ubiquitous (in urban environments);

♦ "In designing tools we are designing ways of being" (Winograd and Flores 1986);

♦ The primary importance of computing for culture is its synthetic, world-building aspect;

♦ Culturally it is *behind the scenes*, just as neurological processing is "behind the seen" (Zeki 1995) – and the heard, felt and tasted too.

# Perspectives

1. Disciplinary

   a. The humanities
   b. The sciences

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4. Historical
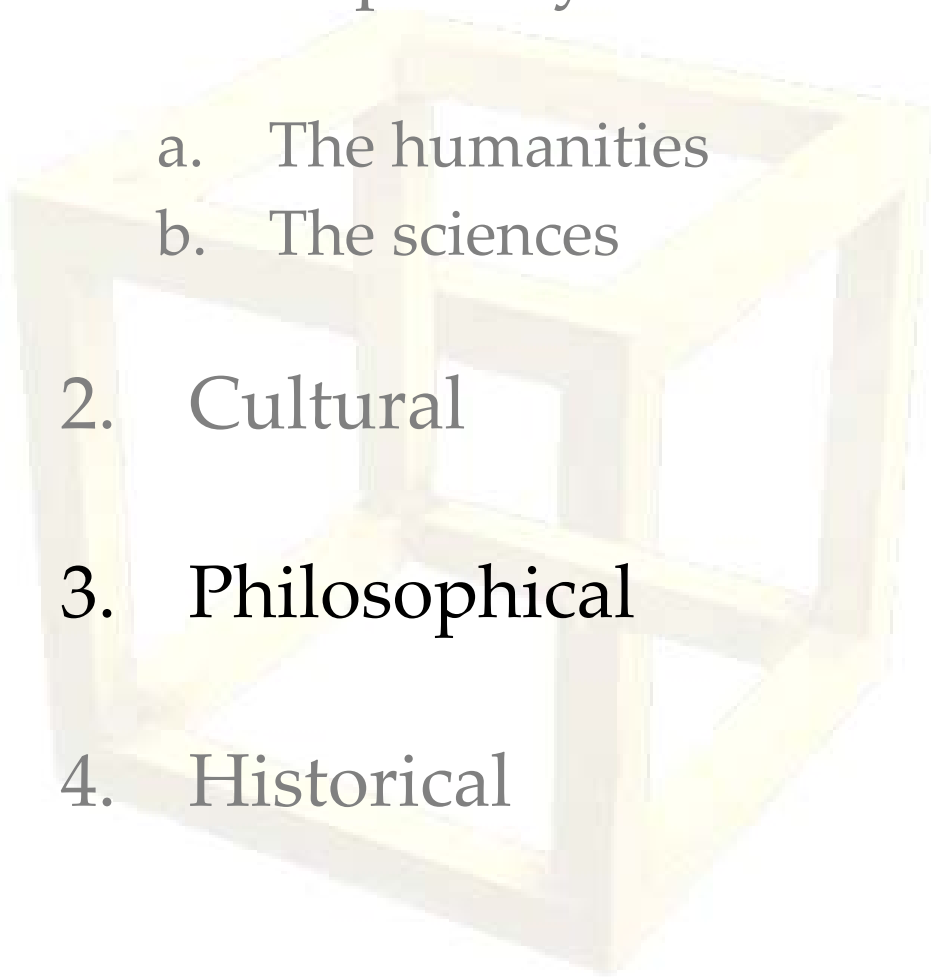
# 3. Philosophical

♦ Distinguish *the philosophy of computing* from *the philosophical perspective on computing* (remembering its plurality).

♦ In the former, nominal sense, the philosophizing is a matter of professional and specialized practice, a "philosophy *of*", e.g. the philosophy of biology. Philosophies *of* focus on one or more "central questions" (Colburn 2000). They are bi-disciplinary.

♦ In the latter, adjectival sense, the philosophizing is as limitless as computing itself and inclusive of all disciplined reflective reasoning of whatever style (analytical, phenomenological *& al.*). It is a perspective rather than a professional specialism.

# 3. Philosophical: a *philosophy of*

Timothy Colburn, *Philosophy and Computer Science* (2000)

*computation*

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# 3. Philosophical: a *philosophy of*

Philosophy of computer science



Third Tier

| Phil. of Physics | Phil. of Biology | Phil. of Psych. | Phil. of Cinema | Phil. of Dance | Medical Ethics |

Second Tier

| Philosophy of Science | Philosophy of Mind | Philosophy of Art | Normative Ethics |

| Epistemology | Metaphysics | Metaethics |

Foundations

Figure 21. A Taxonomy of Philosophy

Colburn's scheme

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# 3. Philosophical: a *philosophy of*

Luciano Floridi, ed., *Philosophy of Computing and Information* (2004)

# 3. Philosophical: a *philosophy of*



Figure 21. A Taxonomy of Philosophy

Third Tier

Phil. of Physics | Phil. of Biology | Phil. of Psych. | Phil. of Cinema | Phil. of Dance | Medical Ethics

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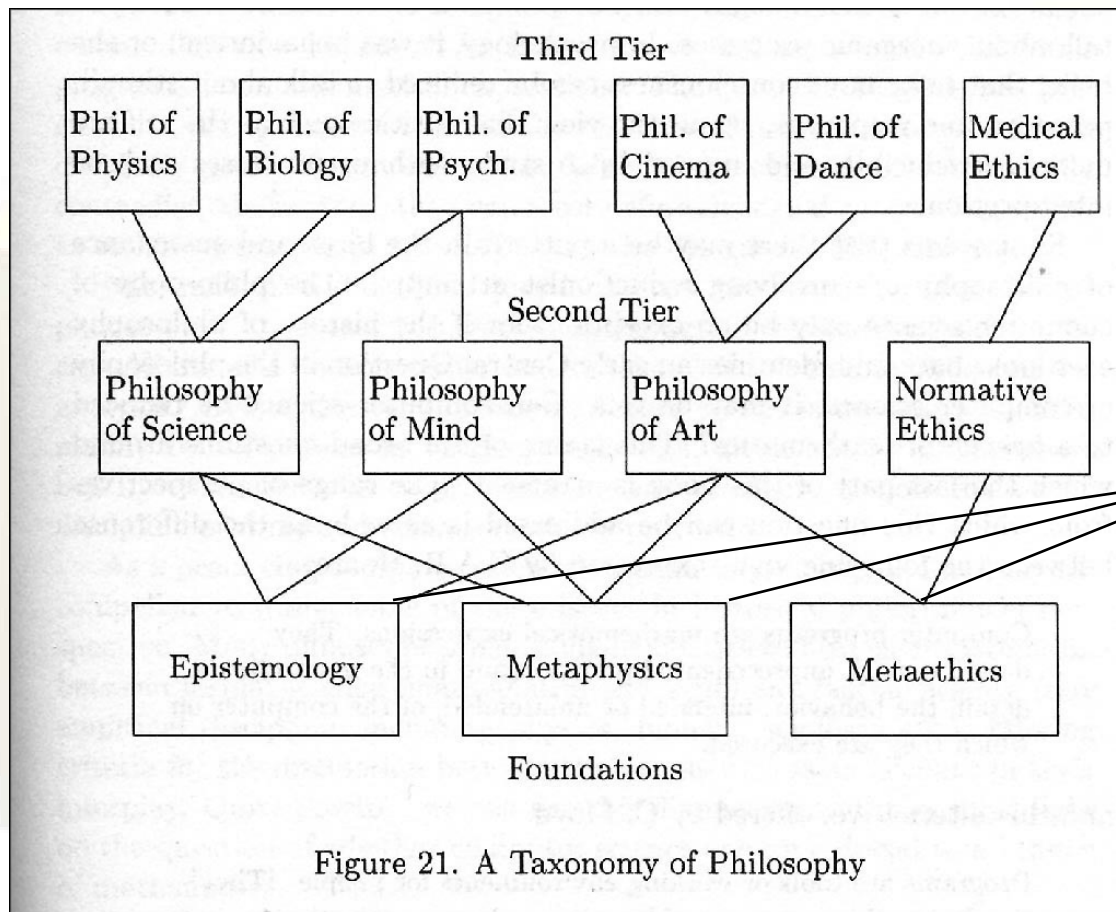
Philosophy of computing

Information science

Philosophy of Information

Floridi's scheme

# 4. Philosophical: perspectives

♦ What are the philosophical questions?

Descriptive

- ♦ **Ontological**: *what is computing, or more specifically, what is software?* (Colburn 1999) → the "software crisis" and how to construe software as science for the purposes of studying its effects (Mahoney 2002).

- ♦ **Epistemological**: *how do we know what we somehow know of the world?* → comparative study of the difference between the algorithmic and the intuitive;

Analytic

- ♦ **Ethical**: *what is ethical in a virtual world,* i.e., *what is computer ethics?* (Moor 1985) → "analysis of the nature and social impact of computer technology and the corresponding formulation and justification of policies for the ethical use of such technology"; how the difference of computer technology "makes a difference in ethical considerations".
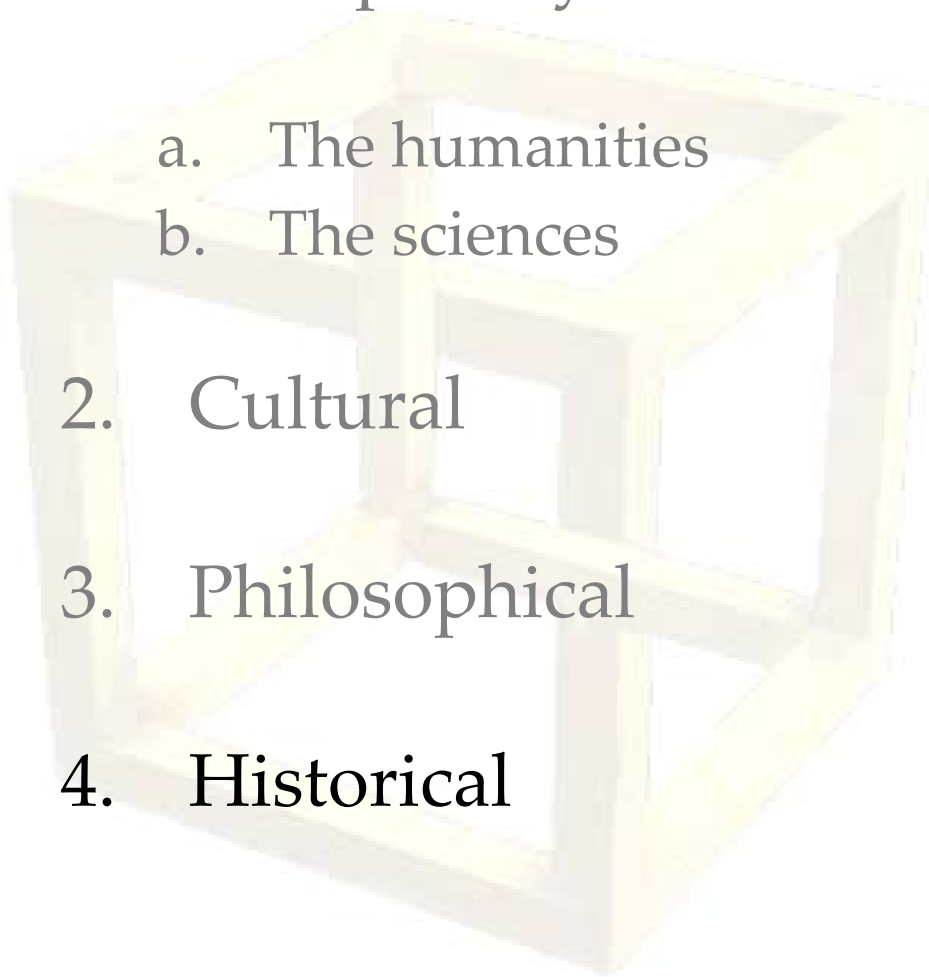
Synthetic

# Perspectives

1. Disciplinary

    a. The humanities
    b. The sciences

2. Cultural

3. Philosophical

4. Historical

# 4. Historical

♦ Historiographical problems related to computing

  ♦ **Chronology to history**: how to see the apparent facts of the matter as *explicanda*;

  ♦ **Narration of progress to exploration of archaeological strata**: "an attempt to return the past to the past's own present, a present with all the possibilities still in it, with all the consequences of actions still unknown" (Dening 1998: 48; cf. Zielinski 2006)

  ♦ **Conventional to ethnographic history**: how to write a history of such recent things (McCarty 2004).

# 4. Historical

♦ Relation of computer science to the disciplines, e.g. of the humanities

- ♦ Strong affinity of concerns shared by computer science and the humanities, which goes back as far as one wishes to seek for it.
- ♦ Practitioners in the diciplines have collaborated for ca the last 40 years.
- ♦ Thoughtful people on both sides have been thinking about the relationship for almost as long.

♦ Nevertheless, recent events show a deep ignorance of the nature of this affinity, and humanists show an equally deep (but explicable) ignorance of methodology.

♦ Even the most primitive of historical reflections show that the perspectives outlined here are vital to progress in computing.

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