



ENGR 195B



Global and Social Issues in Engineering



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Overview.

- Mumford's *Eotechnic, Paleotechnic, and Neotechnic Phases*
- A “Paradigm Model” of Western Civilization
- Eotechnic Phase
- Paleotechnic Phase
- Neotechnic Phase

Historical Paradigms and Historical Phases

- I want to suggest that we can better understand Mumford's discussion of his "Historical-Technical Phases" by first looking to another concept called a "Paradigm".
- The term "paradigm" was first popularized in the philosophy of science by Thomas Kuhn, in his book *The Structure of Scientific Revolutions* (1962).

What is a “Paradigm”, anyway?

Definition of *paradigm*: “a philosophical and theoretical framework of a scientific school or discipline within which theories, laws, and generalizations and the experiments performed in support of them are formulated; *broadly*: a philosophical or theoretical framework of any kind.

E.g., The Newtonian *paradigm* of Physics.

Also, “a conceptual framework through which one makes sense of, and gives meaning to, the world.” → A Worldview (*Weltanschauung*).

E.g., The Scientific Worldview

Source: <https://www.merriam-webster.com/dictionary/paradigm>

What is a “Paradigm”, anyway?

Thomas Kuhn used the term “Paradigm” in order to describe a historical approach to a way of *doing science*. He then described radical changes in the way science is carried out from one historical period to another as a *Paradigm Shift*.

E.g., The Copernican Revolution (Heliocentric vs. Terracentric Model of Planetary Motion).

What is a “Paradigm”, anyway?

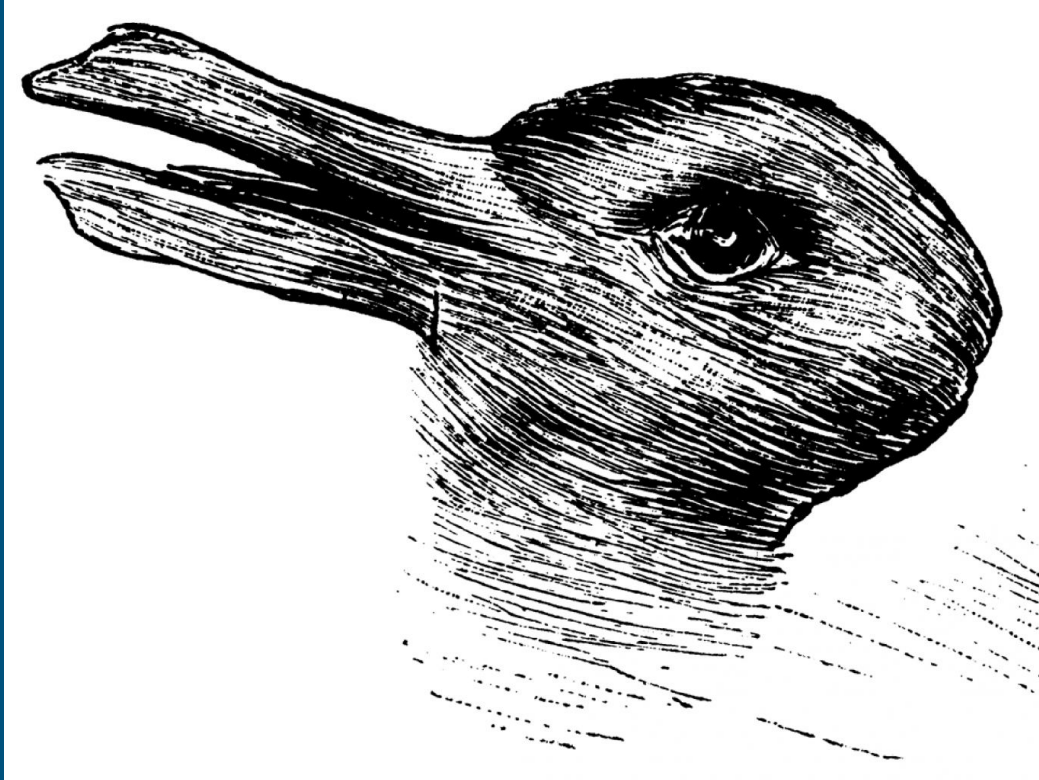
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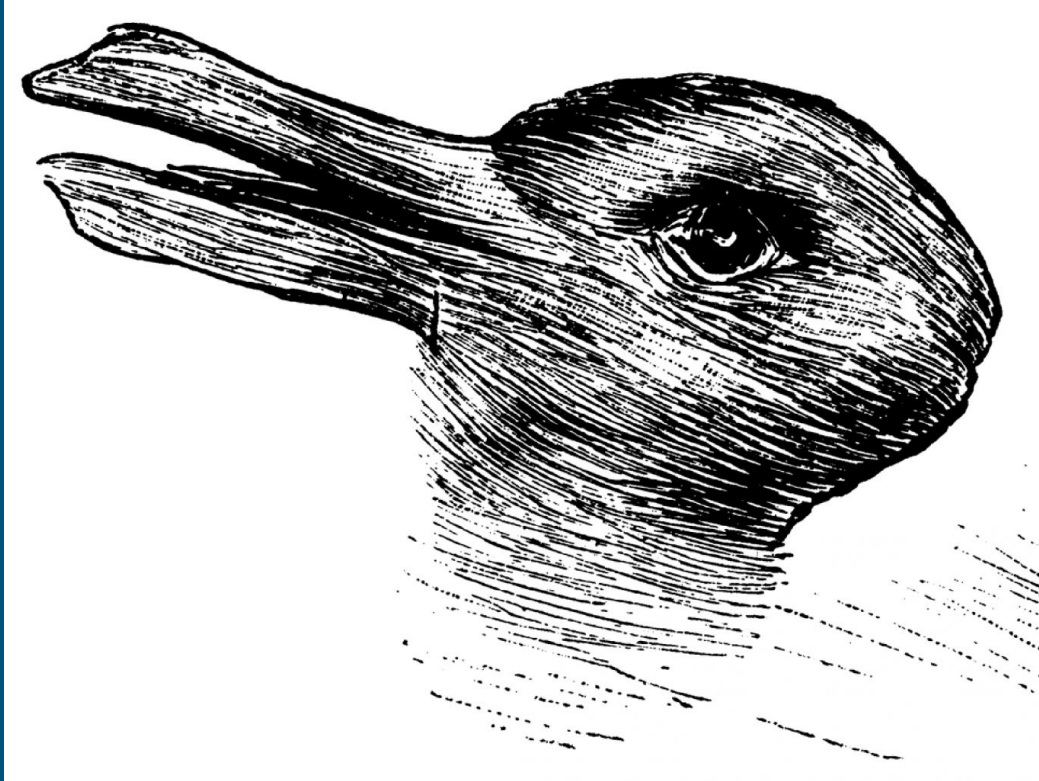
One of Kuhn’s more controversial claims is that when humanity undergoes a Paradigm Shift in science, it is as though we come to live in a new “World”.

Thomas Kuhn was influenced by a group of psychologists during the early 20th century, called the *Gestalt Psychologists*.

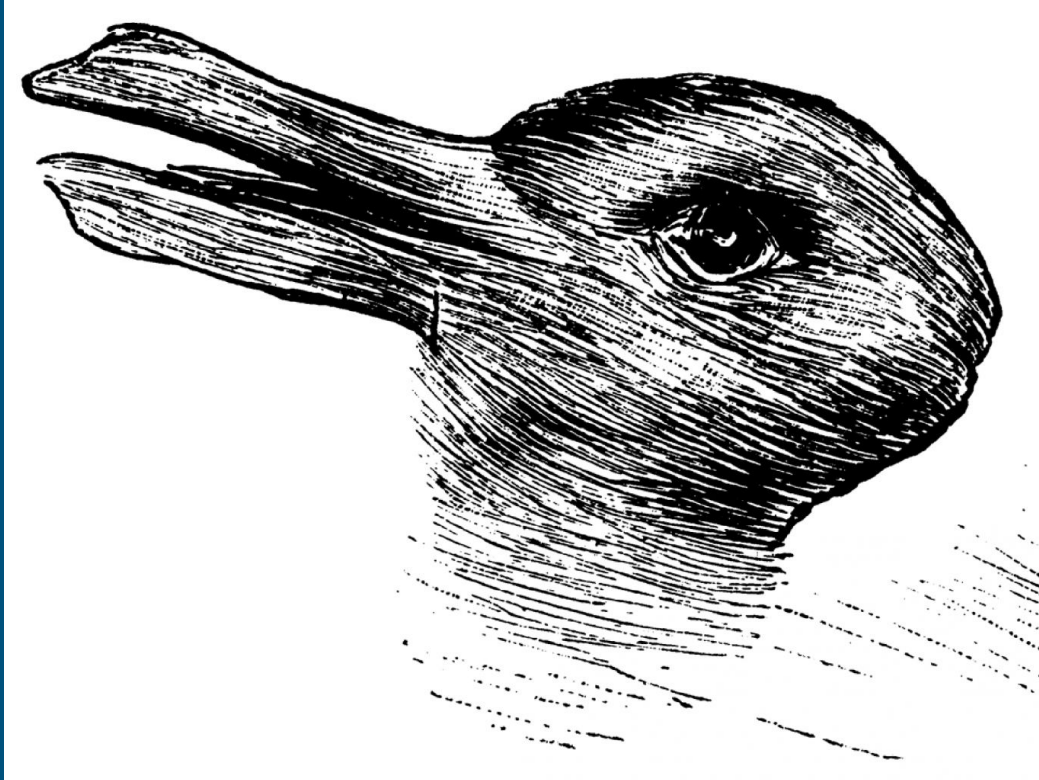
Gestalt Psychology Test → What do you see first?



Is it a Duck or a Rabbit?



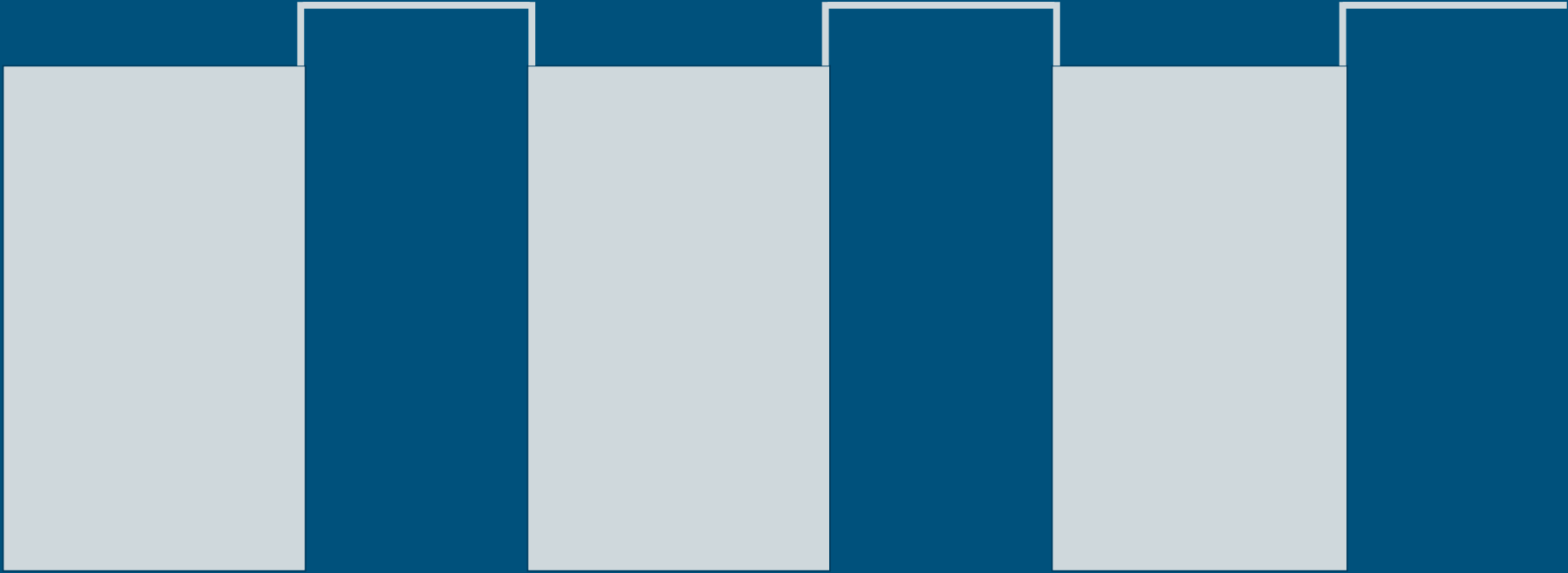
What has been seen cannot be unseen!



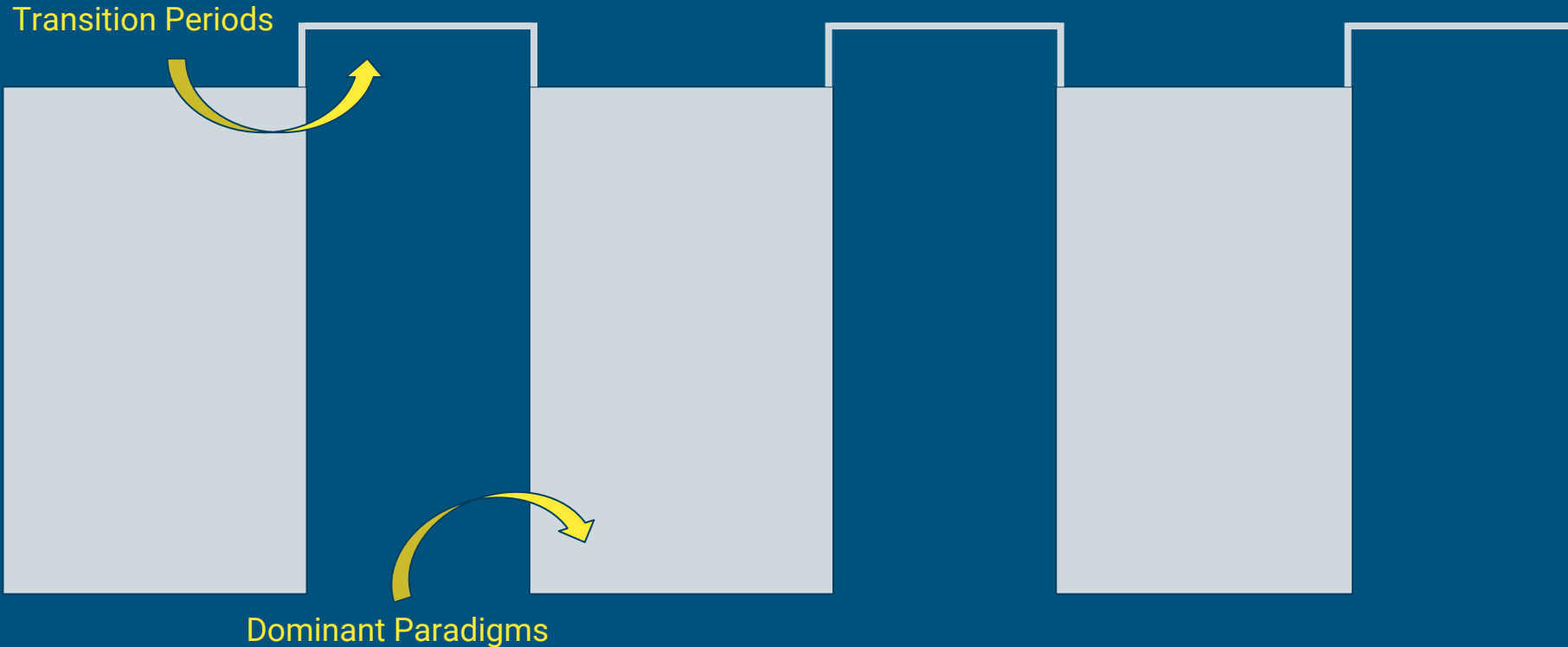
Historical Paradigms and Historical Phases

We can also apply the concepts of “Paradigms” and “Paradigm Shifts” to history.

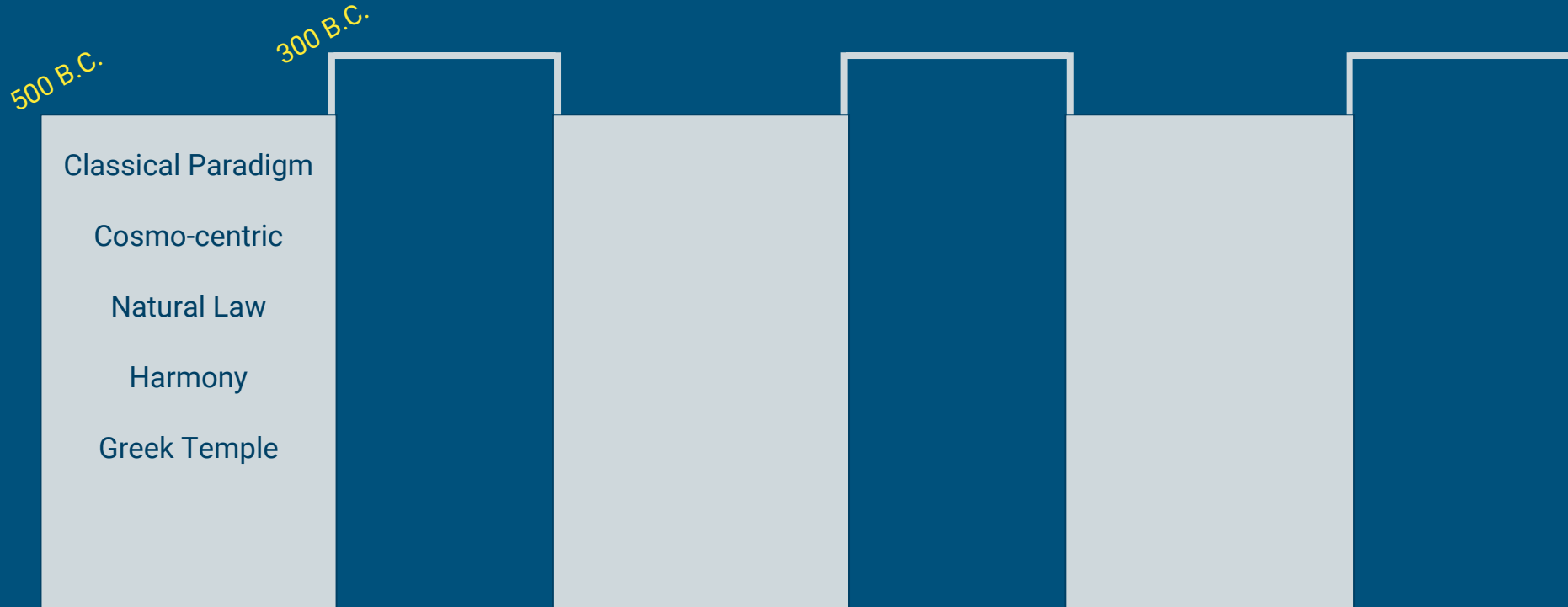
A “Paradigm Model” of Western Civilization



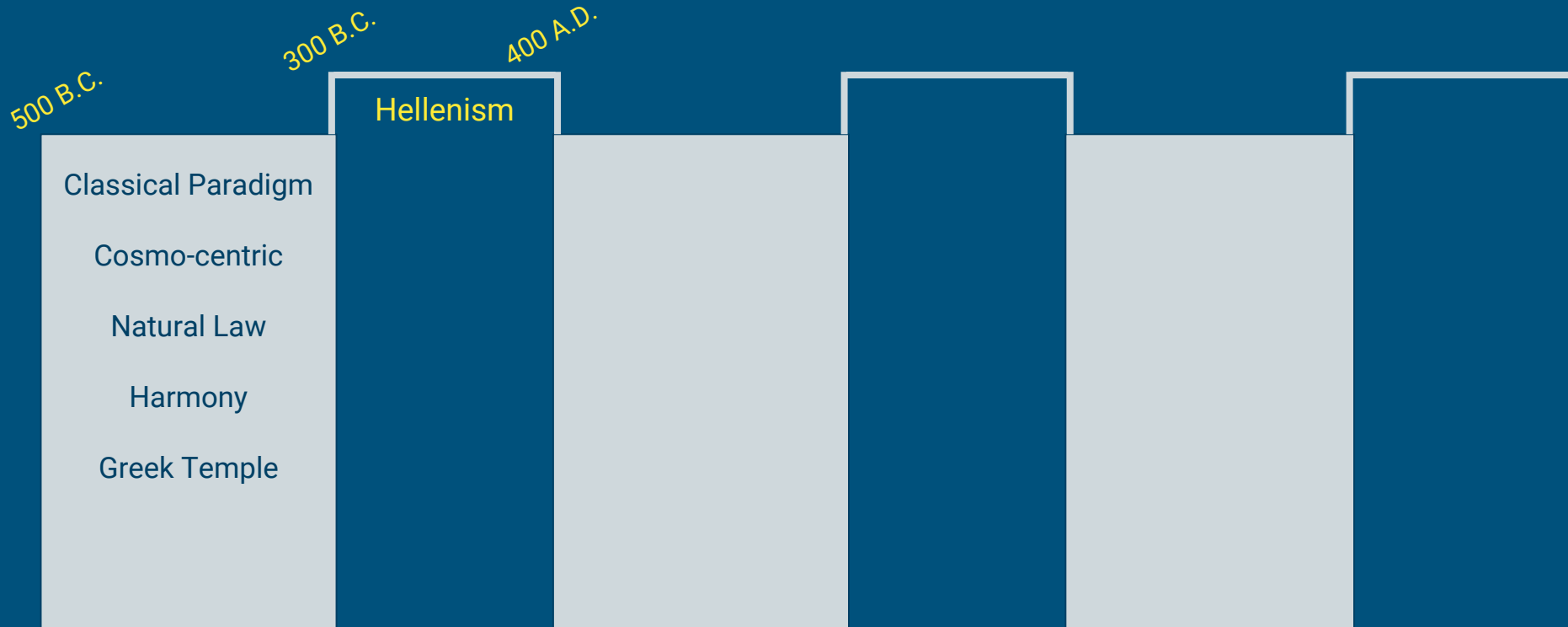
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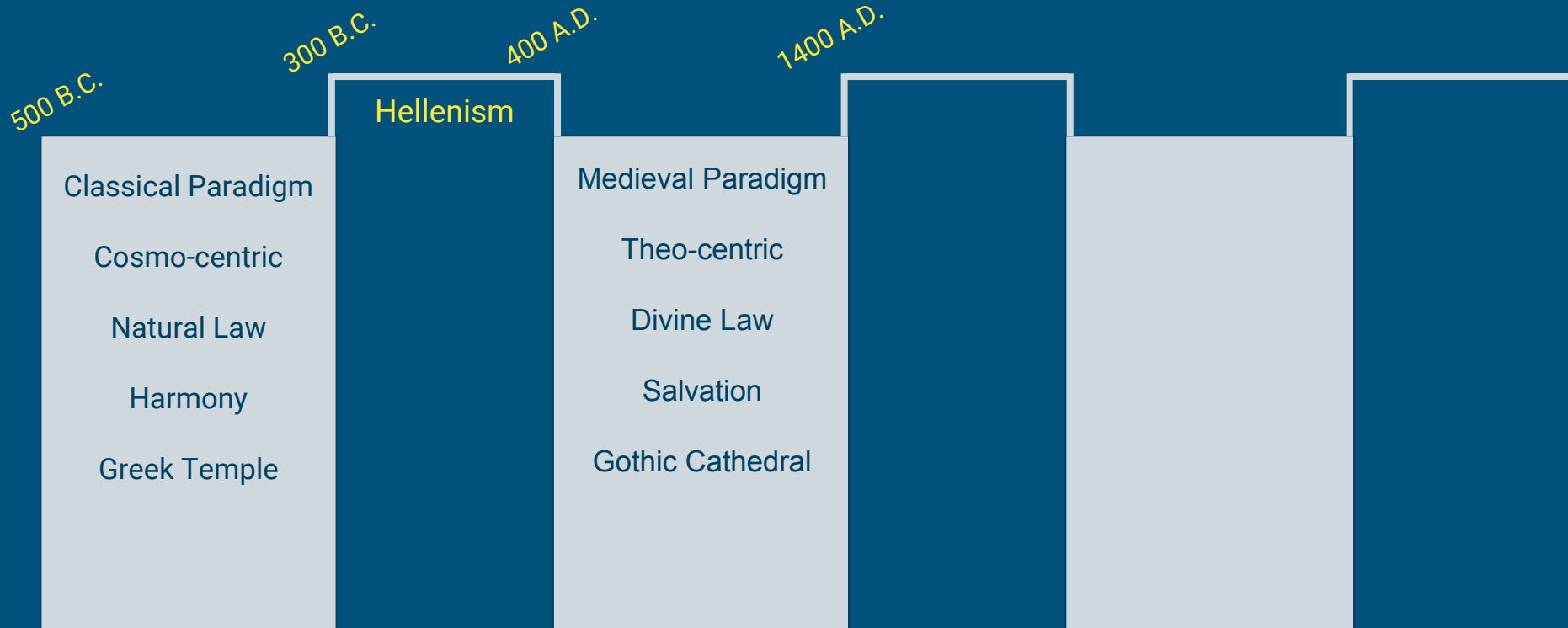
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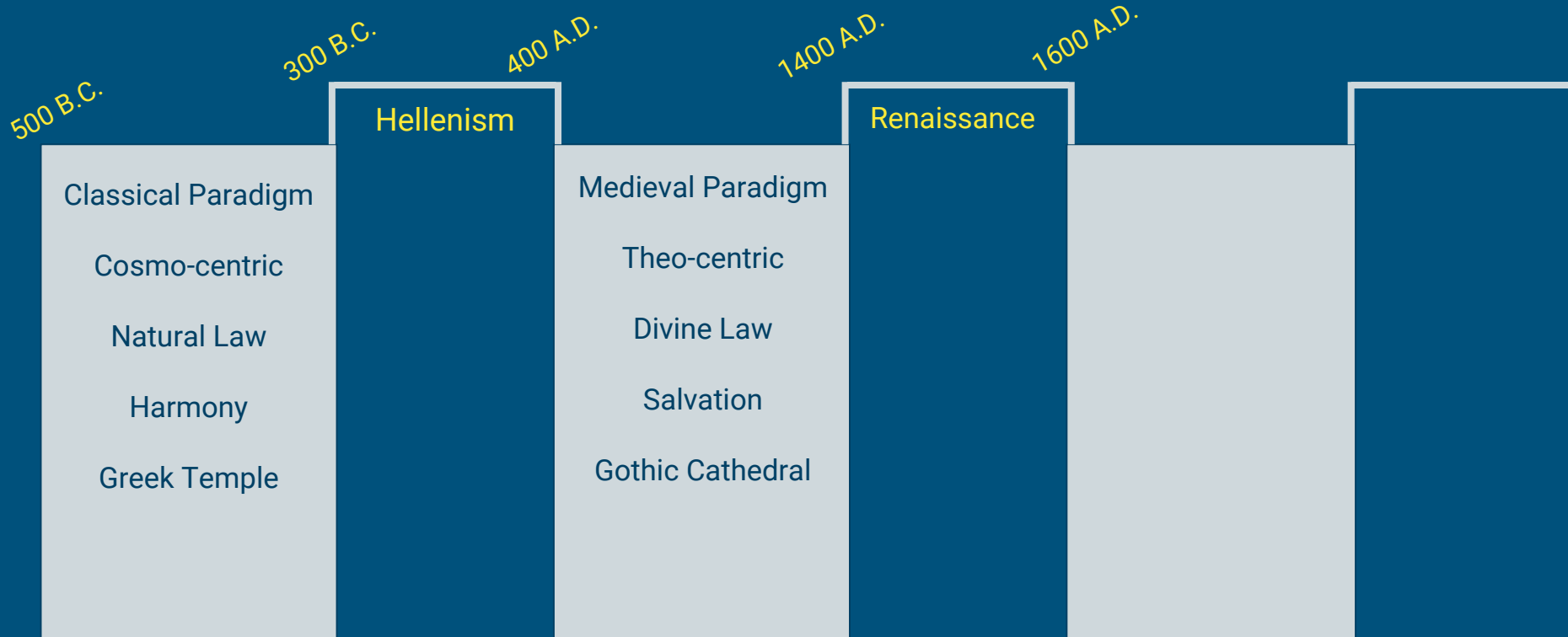
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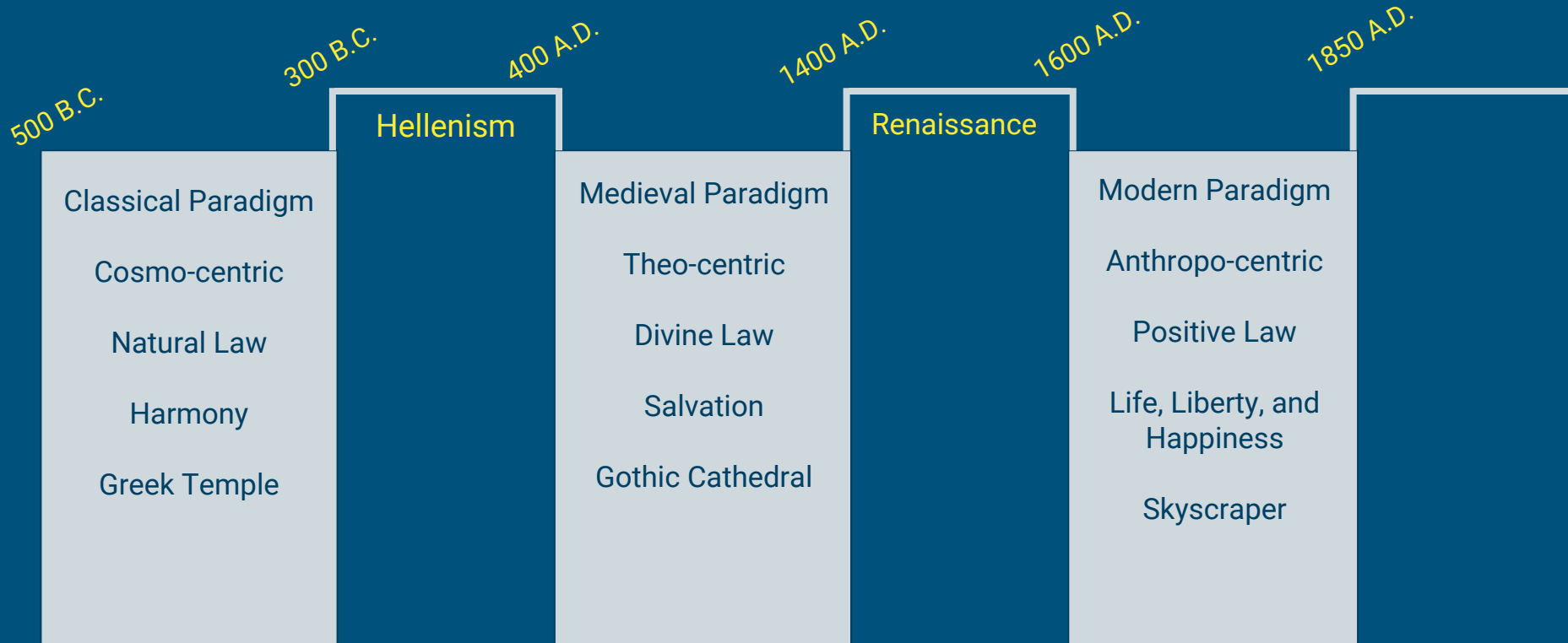
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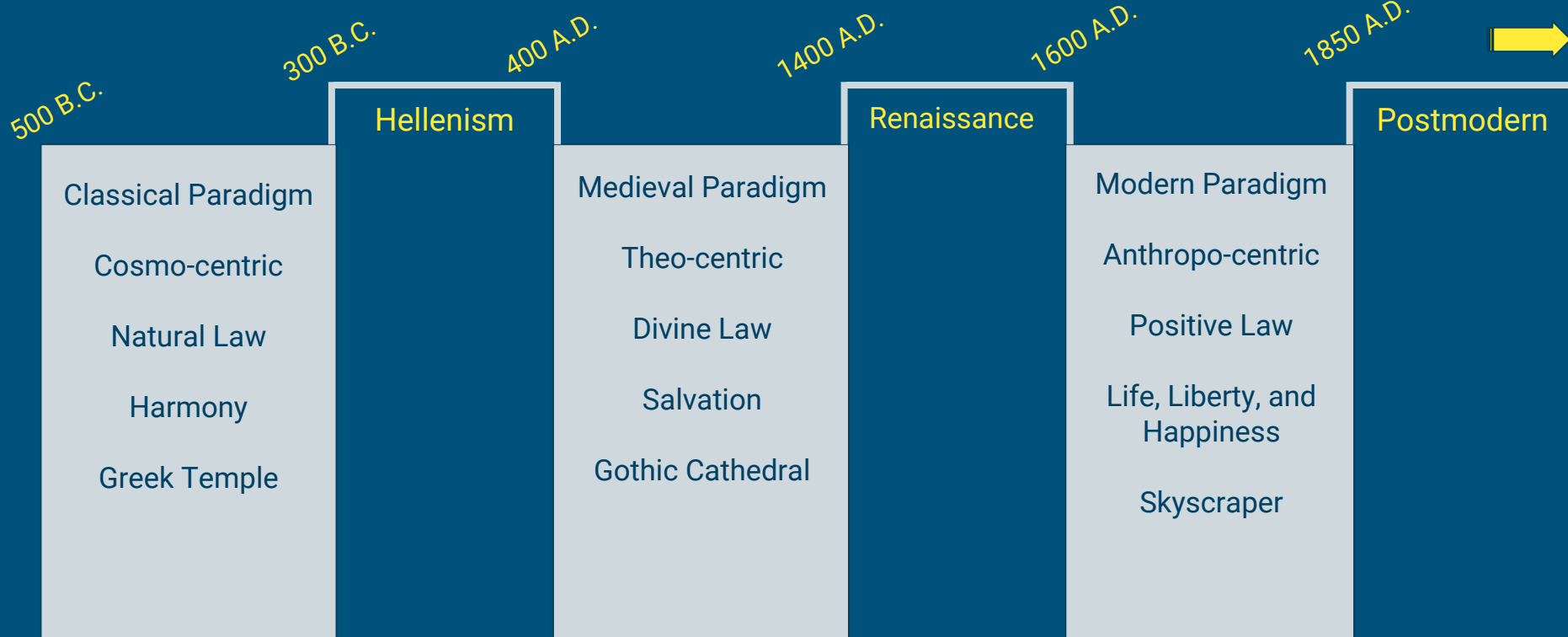
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Mumford's Eotechnic, Paleotechnic, and Neotechnic Phases

For each Phase, we have:

- Regions (locations, time periods, and dates)
- Resources (raw materials)
- Forms of Energy
- Forms of Production
- Illustrations *par excellence*

Mumford's Eotechnic, Paleotechnic, and Neotechnic Phases

Eotechnic

Regions

Europe 1000-1600s

America 1700s →

Resources

Water and Wood

Forms of Energy

Water and Wind

Forms of Production

Watermills and Windmills

Illustrations

Goose-Quill Pen

Mumford's Eotechnic, Paleotechnic, and Neotechnic Phases

Eotechnic

Paleotechnic

Regions

Europe 1000-1600s

America 1700s →

Europe 1750s →

America 1800s →

Resources

Water and Wood

Coal and Iron

Forms of Energy

Water and Wind

Coal

Forms of Production

Watermills and Windmills

Steam Engine

Illustrations

Goose-Quill Pen

Steel Pen

Mumford's Eotechnic, Paleotechnic, and Neotechnic Phases

	Eotechnic	Paleotechnic	Neotechnic
Regions	Europe 1000-1600s America 1700s →	Europe 1750s → America 1800s →	Europe 1830s → America 1850s →
Resources	Water and Wood	Coal and Iron	Electricity and Alloys
Forms of Energy	Water and Wind	Coal	Petroleum/Electrical
Forms of Production	Watermills and Windmills	Steam Engine	Power Plant and Combustion Engine
Illustrations	Goose-Quill Pen	Steel Pen	Fountain Pen

Mumford's Eotechnic, Paleotechnic, and Neotechnic Phases

- Q:
- What's the point to consider, then?
 - Why should we care about thinking about all of this?

Mumford's Eotechnic, Paleotechnic, and Neotechnic Phases

Q: • What's the point to consider, then?
• Why should we care about thinking about all of this?

A: • Because once we introduce something new into the world, *we are building a new world*.
• Once we see the world in a new way, is nearly impossible to return to seeing it as we did before.
• So, we should care about *what we make and how we make it*.