

Science in Classics

经典中的科学

Ending Lecture

The last lecture

1. A journey of reflection
2. Who am I?
3. Don't be led by the nose

【新华社快讯】李克强总理16日下午在天津“8·12”瑞海公司危险品仓库特别重大火灾爆炸事故现场。

16 August 2015

Great explosion in Tianjin
Prime Minister Li Keqiang

↑ 收起 | Q 查看大图 | ⌂ 向左旋转 | C 向右旋转





12 hrs · E

新本
聞

LOCAL PRESS

據說：

古代后羿射日的時候
有超過一個太陽

Share

40 people like this.

875 shares

人喺強國噃，有兩個太陽好奇

5 - 11 hrs

以前后羿九個太陽

啦，兩邊搵搵碎。

1 - 10 hrs

好眼力

1 - 6 hrs

舊曆七月

多個影唔奇

6 hrs

室內打燈，然後key相

5 hrs

真開心可跟你對望 內心閃

1 - 4 hrs









Sodium per 100 g

- Atomic mass
 - Sodium: 22.99
 - Chlorine: 35.45
- If the salt is pure, sodium per 100 g
 $= 100 \times 22.99 / (22.99+35.45)$
 $= 39.3 \text{ g} \approx 39300 \text{ mg.}$

特惠牌
SureBuy

餐桌鹽
Table Salt

成份 Ingredients :

鹽。Salt.

營養資料 Nutrition Information :

本包裝含食用分量 Servings per package: 約 Approx. 91
食用分量 Serving size: 5克g

	每食用分量 Per Serving	每 100 克g
能量 Energy	0 千焦kJ 0 千卡kcal	5 千焦kJ 1 千卡kcal
蛋白質 Protein	0 克g	0 克g
總脂肪 Total Fat	0 克g	0 克g
饱和脂肪 Saturated Fat	0 克g	0 克g
反式脂肪 Trans Fat	0 克g	0 克g
固醇 Cholesterol	0 毫克mg	0 毫克mg
總碳水化合物	0.0 克g	0.3 克g
- 糖 Sugars	0 克g	0 克g
- 膳食纖維 Dietary Fibre	0 克g	0 克g
鈉 Sodium	1863 毫克mg	37254 毫克mg
鈣 Calcium	0.2 毫克mg	4.1 毫克mg

請存放於陰涼
乾燥處，避免陽光直
接照射。

Store in a cool and dry place,
keep away from direct sunlight.

此日期前最佳：見包裝 (日/月/年)

特惠牌
SureBuy

粗鹽
Coarse Salt

成份 Ingredients :

鹽。Salt.

營養資料 Nutrition Information :

本包裝含食用分量 Servings per package: 約 Approx. 91
食用分量 Serving size: 5克g

	每食用分量 Per Serving	每 100 克g
能量 Energy	1 千焦kJ 0 千卡kcal	10 千焦kJ 2 千卡kcal
蛋白質 Protein	0 克g	0 克g
總脂肪 Total Fat	0 克g	0 克g
- 饱和脂肪 Saturated Fat	0 克g	0 克g
- 反式脂肪 Trans Fat	0 克g	0 克g
膽固醇 Cholesterol	0 毫克mg	0 毫克mg
總碳水化合物	0.0 克g	0.6 克g
Total Carbohydrates	0.0 克g	0.6 克g
- 糖 Sugars	0 克g	0 克g
- 膳食纖維 Dietary Fibre	0 克g	0 克g
鈉 Sodium	1864.5 毫克mg	37290 毫克mg
鈣 Calcium	2.3 毫克mg	46.2 毫克mg

請存放於陰涼
乾燥處，避免陽光直
接照射。

Store in a cool and dry place,
keep away from direct sunlight.

此日期前最佳：見包裝 (日/月/年)
Best Before: See Packaging
(DD/MM/YYYY)

MANUFACTURED UNDER
COMMISSION OF D
OF 5/F DEVON HOUSE
QUARRY BAY, HONG KONG
牛奶國際商標有限公司
香港鰲魚涌太古坊
TEL 電話 : (852) 52175111
IMPORTED AND
進口商及經銷商
WELLCOME, 5
TAIKOO PLACE
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東百貨股份有限公司
台山市上林區
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4

16



Reduced sodium salt



Children: why why why?

Why should we eat vegetables?
The taste is bad!

Vegetables contain **nutrients** that
make you healthy!

Why should I have good health?

If you are not healthy, you won't
be **happy**.

Why should I be happy?

Hm, yes, of course, everyone
should be happy.

Why should everyone be happy?

.....

Questions of different levels

Technical science

- **Observation:** What is A?
 - **Inference:** If B happens, what would happen?
-
- **Meaning:** What does C mean?
 - **Value:** Do I accept D?

General education science

Vegetables contain **nutrients** that **make** you healthy!

If you are not healthy, you won't be **happy**.

Hm, yes, of course, everyone **should be happy**.

Big and particular questions

- Technical and GE sciences are about observation, ..., value.
- Technical science focuses on
 - Observation, Inference
 - *Particular questions*
- GE science focuses on
 - Meaning, Value
 - *Big questions*

Technical science

- **Observation:** What is A?
- **Inference:** If B happens, what would happen?
- **Meaning:** What does C mean?
- **Value:** Do I accept D?

General education science

- 
1. Are we doing popular science?
 2. Are we doing 1000-level technical science?

No!

Diascopic-science (透观科学) Approach



Science

Big questions

Who am I?
What and how do I
know about Nature?
What is life?

...

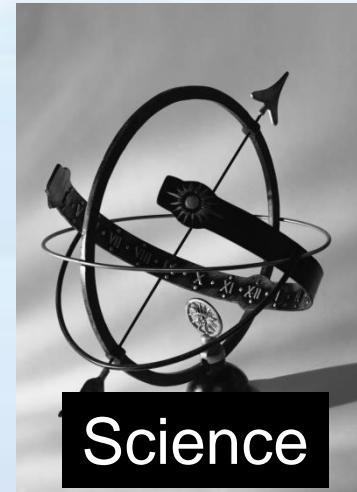
Learning Outcomes

Ability



read and discuss
science texts with
confidence

Intellectual



Science



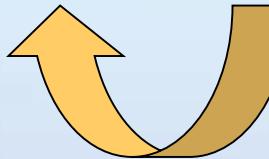
identify the essential characteristics of various methods of scientific inquiry that have significant impacts on how human beings view life and universe.

world (世界)



formulate informed personal views on the societal implications of scientific explorations.

society (社会)

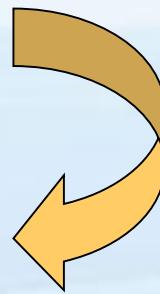


relate the development in natural sciences highlighted in the course to contemporary human conditions.

individuals (个体)



Science



evaluate
highlighted
scientific
methods using
multiple
perspectives

science (科学)

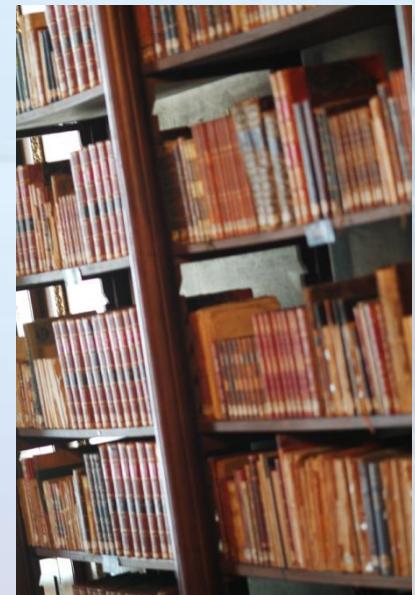
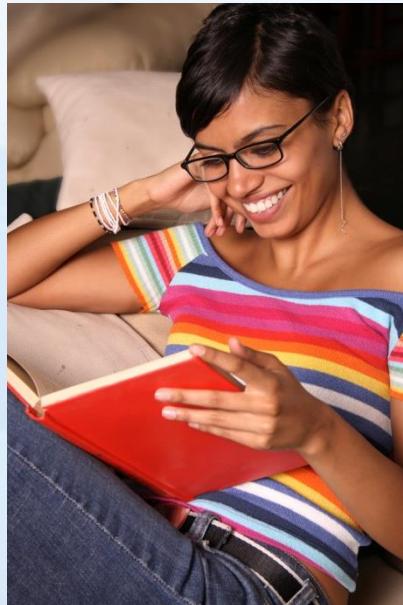
Learning Outcomes

- read and discuss science texts with confidence. (ability/能力培养)
- evaluate the scopes of application, achievement and limitations of highlighted scientific methods using multiple perspectives. (science/反思科学)
- identify the essential characteristics of various methods of scientific inquiry that have significant impacts on how human beings view life and universe. (world/世界)
- formulate informed personal views on the societal implications of scientific explorations. (society/社会)
- relate the development in natural sciences highlighted in the course to contemporary human conditions. (individuals/个体)

Still remember this slide?

Reading classics

- We retrace the journeys of giants like Plato, Newton, Darwin,
- nurture a good habit of reading --- lifelong.
- develop a personal taste of reading classics.

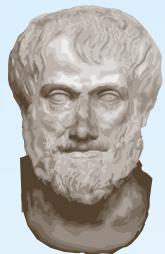


How about this?

Writing



- Express your own personal view of the physical world, the world of life and “Who I am”.



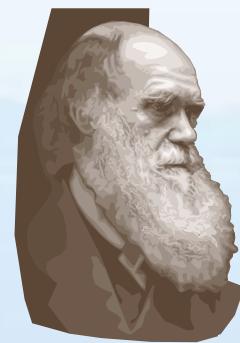
Republic



Principia



On the Origin of Species



Silent Spring



Science and Method



In Search of Memory



A Shorter Science and Civilisation in China



But we are still beginners.

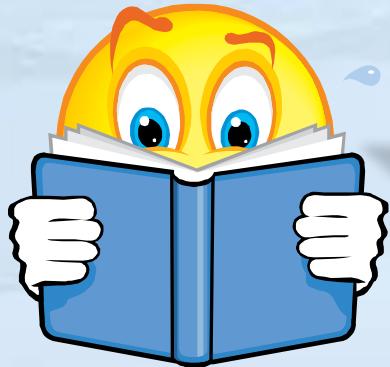
You have written many passages and done many quizzes.

The screenshot shows a Moodle course interface for 'Course: Science in Classics (Xidian)'. The left sidebar lists various course sections: Participants, Badges, Competencies (selected), Grades, General, Download Area, Quizzes, Reflective Journals 1 and 2, Zoom Lessons, Self-service Equipment Testing, Home, Dashboard, and Calendar. The main content area is titled 'Quizzes' and contains information about upcoming quizzes:

- Quiz for Trial (Text 1: Plato)**: Available from 12 May (12pm) to 17 May (2pm). Attempts allowed: 1. Time limit: 12 minutes. A 'Mark as done' button is present.
- Quiz 1 (Text 2: Newton)**: Available from 12 May (12pm) to 17 May (2pm). Attempts allowed: 1. Time limit: 12 minutes. A 'Mark as done' button is present.
- Quiz 2 (Text 4: Carson)**: Available from 19 May (12pm) to 24 May (2pm). Attempts allowed: 1. Time limit: 12 minutes. A 'Mark as done' button is present.
- Quiz 3 (Text 6: Kandel)**: Available from 26 May (12pm) to 31 May (2pm). Attempts allowed: 1. Time limit: 12 minutes. A 'Mark as done' button is present.

Below the quizzes, there is a section titled 'Reflective Journals 1 and 2'.

You have also read many reading guides.



Reading Guide to Grant, *Physical Science in the Middle Ages*. New York: John Wiley & Sons, 1971.

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Reading Guide to Grant, *Physical Science in the Middle Ages*. New York: John Wiley & Sons, 1971.

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Reading Guide to Grant, *Physical Science in the Middle Ages*. New York: John Wiley & Sons, 1971.

Reading Guide to Grant, *Physical Science in the Middle Ages*, New York: John Wiley & Sons, 1971. (Q124.97 G7)

Read: Chapter 4.

Core question:

How to find and express scientific truth?

Introduction

- brief overview of the book
- background information . . . Ch 3:
 - ↳ beginning, address the decline of science from 500AD – 1000AD
 - ↳ the Greek and Latin encyclopedias from
 - ↳ the translation of Greek books into Arabic and Latin
- brief summary of the selected reading (Ch 4)
- things to ponder

Since Renaissance, a revival of Hellenistic thoughts, human reason has gradually become widely accepted as essential in searching for the principle(s) governing the universe and this gave rise to modern science. Some remarkable characters like Copernicus, Galileo, Newton and Darwin are generally regarded as founders of modern science. What was science like before these people? If modern science has its roots in ancient Greek science, how was the knowledge preserved, and what was its role in the development of science? We may find the answers in the *Physical Science in the Middle Ages*. Written by Edward Grant, a respectable scholar in history of science, the book gives us an account of the development of science in Western Europe from the period of the Late Roman Empire to around 1200 AD, with a focus on Aristotelian thoughts which were dominating at the time.

The book begins with the historical background of the decline of science. The state of science fell to its worst around the time of 500 AD, when the Roman Empire disintegrated. Lack of political stability and patronage, combined with the rise of Christianity, caused science achievement to deteriorate. To many Christians at that time, science was either deemed useless, or seen as the "handmaid" of theology, only to be studied for the better understanding of the Christian religion. Furthermore, most of the talented people had been drawn into service for the Church, leaving few to the

Many discussion sessions



The last lecture

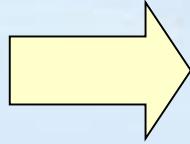
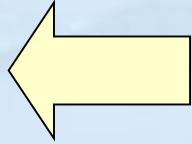
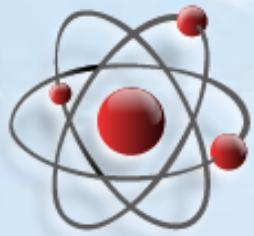
1. A journey of reflection
2. Who am I?
3. Don't be led by the nose

Retrace Our Journey

- An intellectual expedition starting from “Who am I?”
- We are invited to investigate the world.



What can the
world tell me
about who I am?



$$\begin{aligned} \frac{1}{V} \int z dV &= \frac{\pi r^2}{V H^2} \int_0^h z(H - z)^2 dz \\ &= \frac{\pi r^2}{V H^2} \int_0^h (z^3 - 2z^2 H + z^2 H^2) dz \\ &= \frac{\pi r^2}{V H^2} \left[\frac{z^4}{4} - \frac{2z^3 H}{3} + \frac{z^2 H^2}{2} \right]_0^h \\ &= \frac{\pi r^2 h^4}{V H^2} \left[\frac{1}{4} - \frac{2H}{3} + \frac{H^2}{2} \right]. \end{aligned}$$

The physical universe

Part I of the course

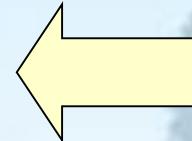
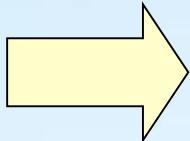


www.uva.nl/onderwijs

The world of life

Part II of the course





phenomena ≠ theory

*physical laws were discovered
from experiments with
reasoning*

*the laws are expressed in
mathematics*

natural selection

pollution

issues arising



*Now I begin to know
more about myself.*

A sense of beauty?

What is mind?



- Part III of the course: a reflection on our understanding.

The Allegory of the cave



Plato's Allegory of the cave, Engraving of Jan Saenredam (1565-1607) after a painting of Cornelis Corneliszoon van Haarlem (1562-1638) (Wikimedia Commons)

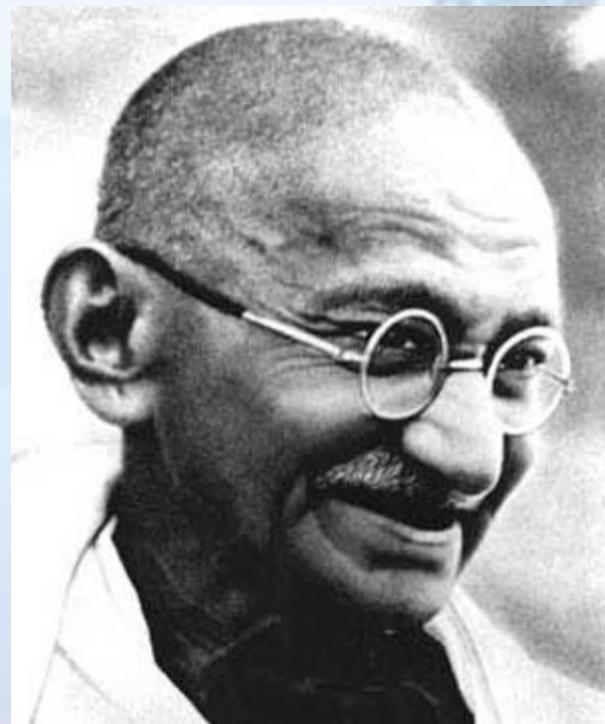


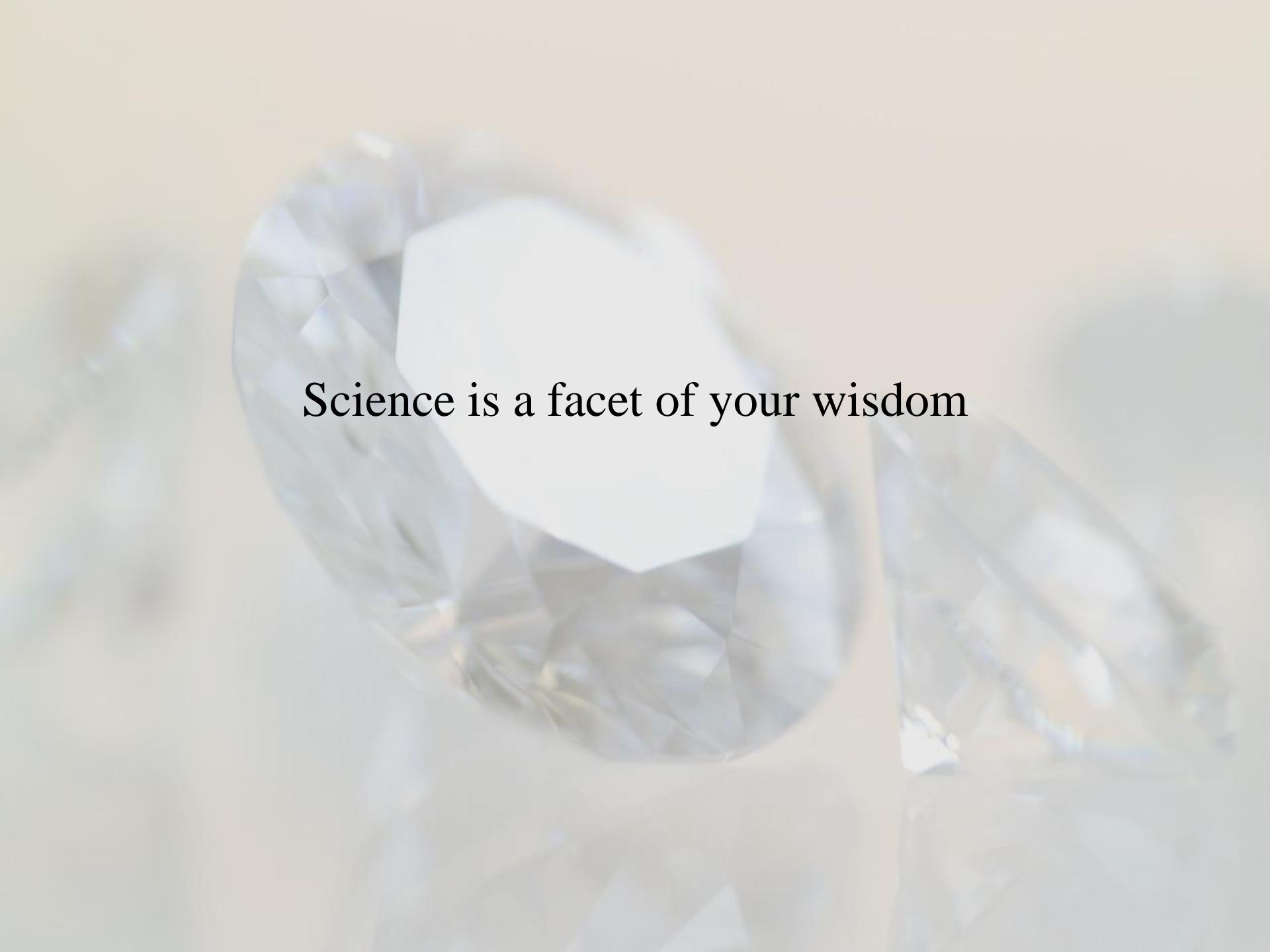
Where are you
now? Outside
the cave? Inside
the cave?
Or somewhere
else?



Mohandas Karamachand Gandhi's Seven Deadly Sins

- Wealth without Work
- Pleasure without Conscience
- Science without Humanity
- Knowledge without Character
- Politics without Principle
- Commerce without Morality
- Worship without Sacrifice



A large, clear, faceted diamond or crystal is positioned in the center of the frame. A bright light source, possibly a camera flash, is positioned directly behind the diamond, creating a strong lens flare effect. The diamond's facets are clearly visible, reflecting light in various directions. The background is a soft, out-of-focus yellowish-tinted light.

Science is a facet of your wisdom

The last lecture

1. A journey of reflection
2. Who am I?
3. Don't be led by the nose

Hu Shih (胡适; 1891-1962)

- 1910: was sent to study agriculture at Cornell University
- 1912: changed major to philosophy and literature.
- went to Columbia University to study philosophy under John Dewey
- 1917: got Ph.D., taught at Peking University.

- 1938-1942: the Republic of China's ambassador to the USA
- 1946-1948: Chancellor of Peking University
- 1957: president of the Academia Sinica in Taipei, where he remained until his death.
- One of the leading and influential intellectuals during the May Fourth Movement and later the New Culture Movement.

胡适自序 - 《介绍我自己的思想》

-在这些文字里，我要读者学得一点科学精神，一点科学态度，一点科学方法。科学精神在于寻求事实，寻求真理。科学态度在于撇开成见，搁起感情，只认得事实，只跟着证据走，科学方法只是“大胆的假设，小心的求证”十个字。没有证据，只可悬而不断；证据不够只可假设，不可武断；必须等到证实之后，方才奉为定论。

In these essays, I would like my readers to learn the spirit of science, scientific attitude, and scientific method. The spirit of science is to seek the fact and the truth. To work with a scientific attitude is to put aside our prejudices and feelings, only to recognize the fact and follow the evidence. The scientific method is just to “boldly hypothesize and carefully verify”. Without evidence, we should not make any judgment yet. Without sufficient evidence, we can only hypothesize but should not make arbitrary judgment. Only when there is verification, we can draw a conclusion.

- 少年的朋友们，用这个方法做学问，可以无大差失，用这种态度来做人处事，可以不至于被人蒙着眼睛牵着鼻子走。

My young friends, if you study in this way, you will not make big mistakes. If you live in this way, you will at least not be blindfolded and led by the nose.

- 从前禅宗和尚曾说：“菩提达摩东来，只要寻一个不受人惑的人”。我这里千言万语，也只是要教人一个不受人惑的方法。被孔丘、朱熹牵着鼻子走，固然不算高明；被马克思、列宁、斯大林牵着鼻子走，也算不得好汉。我自己决不想牵着谁的鼻子走。我只希望尽我微薄的能力，教我的少年朋友们学一点防身的本领，努力做一个不受人惑的人。

A Zen monk once said, “Bodhidharma came to the East only to look for one person who was not deluded.” Here I have said a thousand words but I just want to teach people how to avoid delusion. It is of course not clever to be led by the nose by Confucius and Zhu Xi, neither is it good to be led by the nose by Marx, Lenin, and Stalin. I never want to lead anyone by the nose. I only wish to exhaust my meagre effort to teach my young friends some skills to fight against delusion.

370-415

HYPATIA OF ALEXANDRIA

MATHEMATICIAN

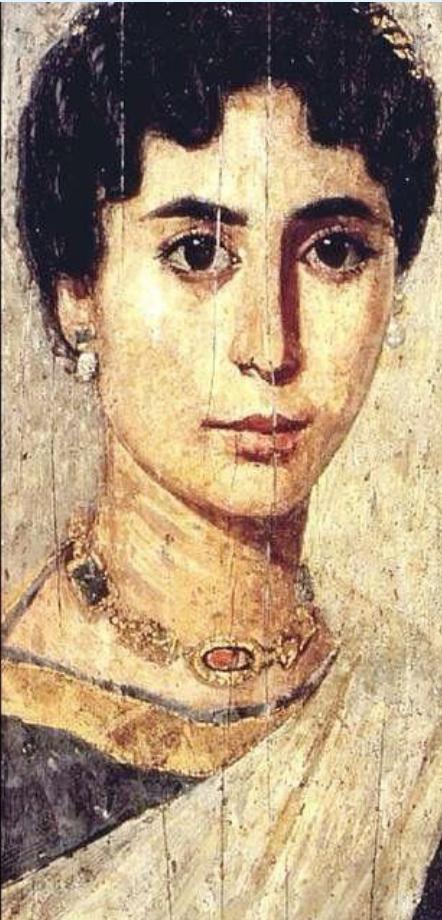
FIRST WOMAN IN HISTORY
TO MAKE CONTRIBUTIONS
IN HER FIELDS.

WAS A COMPILER, EDITOR,
AND PRESERVER OF EARLY
MATHEMATICAL WORKS.

SHE WAS THE FIRST
WOMAN TO WRITE ON
MATHS AND REFINE
EQUATIONS.

WAS THE HEAD OF THE
PLATONIST SCHOOL WHERE
SHE TAUGHT MATH,
PHILOSOPHY, AND
SCIENTIFIC ASPECTS OF
NEOPLATONISM.

HER DEATH MARKED THE
DECLINE OF ALEXANDRIA
AS A CENTER OF LEARNING.



- Reserve your right to think, for even to think wrongly is better than not to think at all.

The end of this course

Science in Classics