Global Focus on Knowledge
Lecture Series

Information Changes the World

Why Information Technology Now？
Day 3

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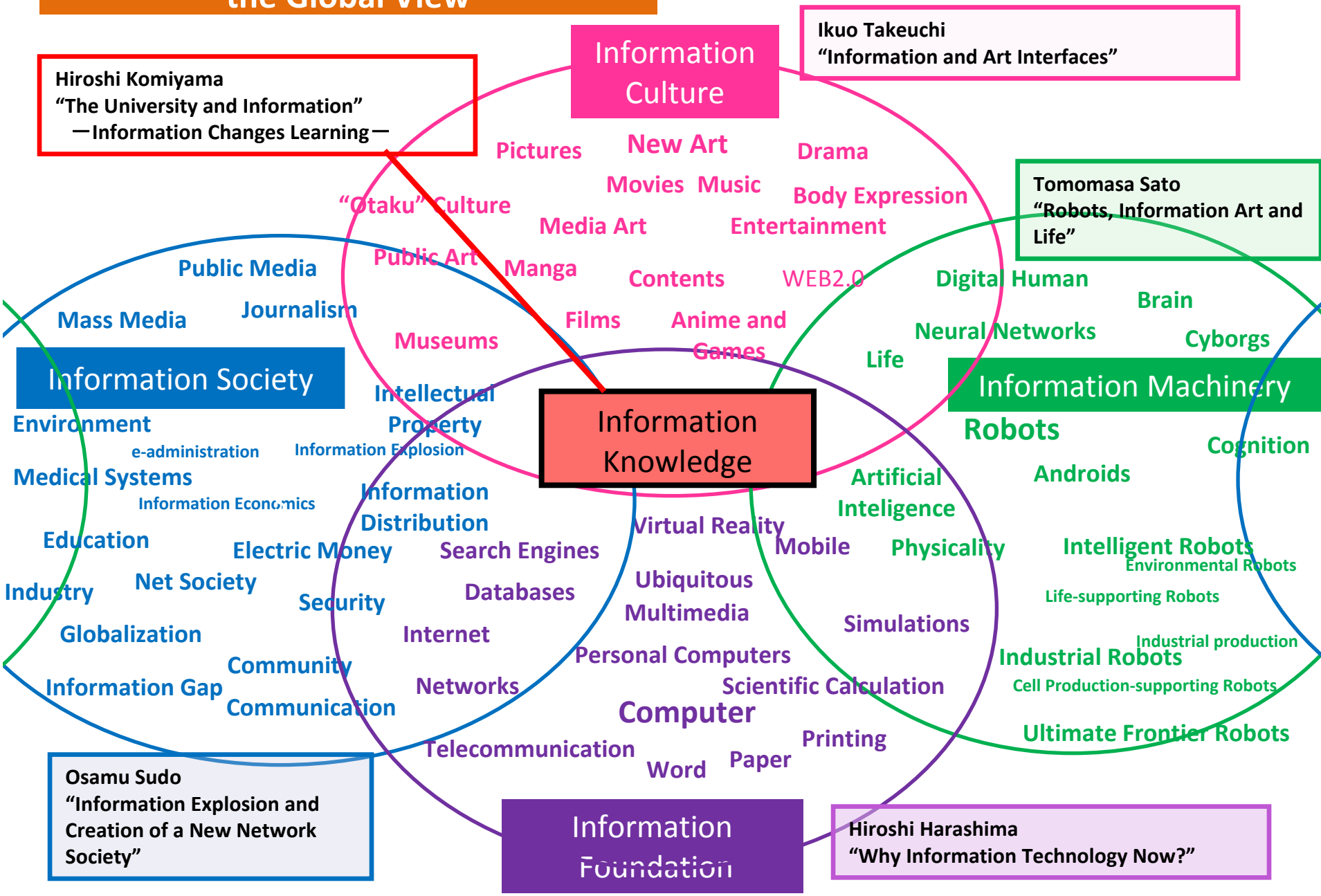
Information Changes the World
—the Global View—



Basic Theme

Now, information technology is in a drastic developmental phase.

Why is this？

Let us see this in 10 year, 100 year and 1000 year increments.

How would a historian after 1000 years describe today’s developments in information technology?

Let’s review the last lecture.

Observing the progress of IT over the past 1000 years …

Competition for Dominance of the World

- Domination of the Land

  Mongol (13-14c), Ottoman Turks(15-16c)

- Domination of the Sea （sailing）

  Spain・Portugal (16c), Netherlands (17c)
  France・England (18c)

  －industrial revolution－ （railroad technology）

- Domination of the Sky （aviation/ space technology）

  the World War　England, France, USA vs Germany, Italy, Japan
  the Cold War　USA　vs Soviet Russia

- Domination of Networks （information technology）

In the past,
England won out in the age of sea and experienced the industrial revolution.

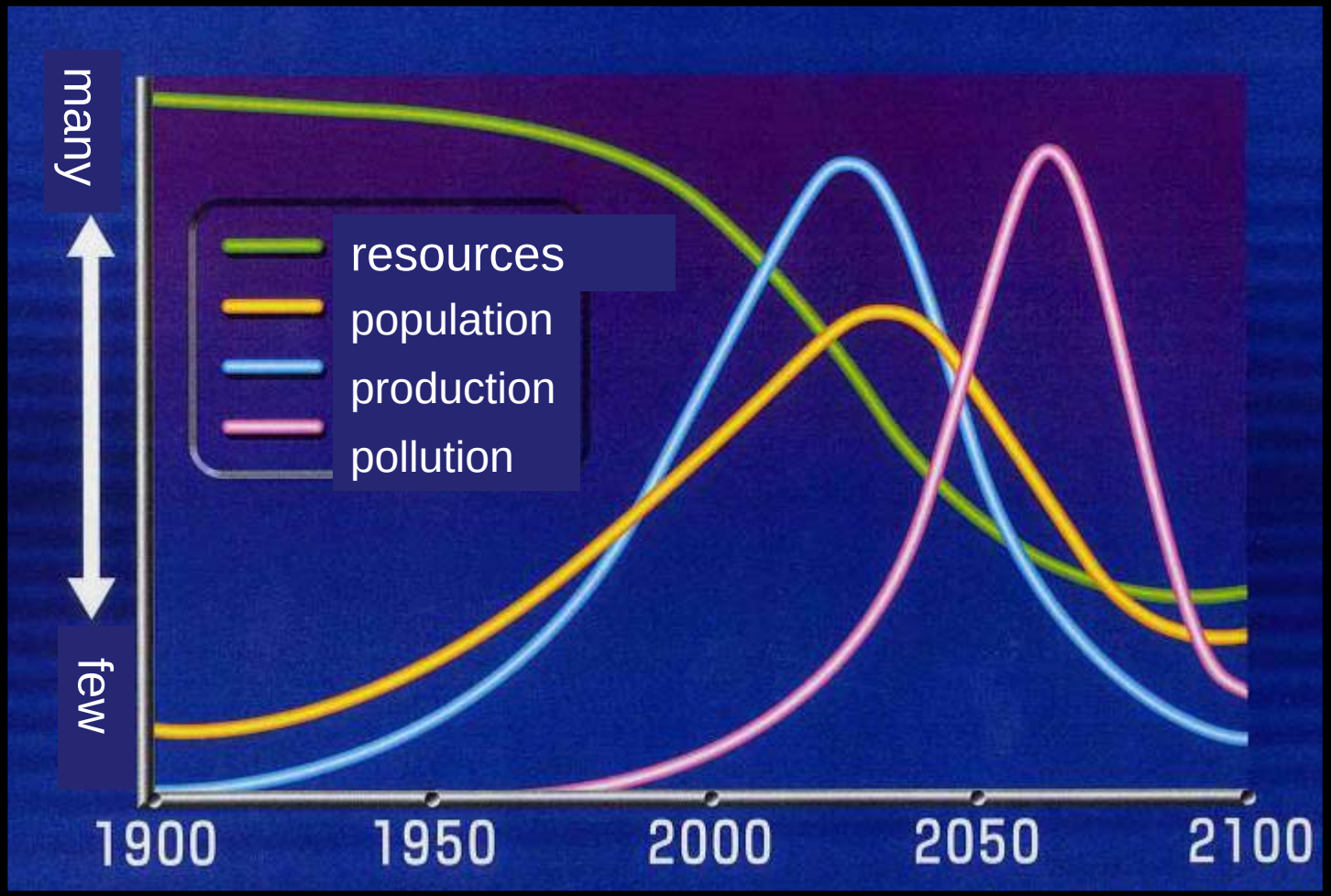
Recently,
the USA won out in the age of sky and has experienced an information revolution.

The 21st century,
the age of information, started as the age of the USA.

But how long will this age last?

How will the 21st century look?

The 21st Century will be a troubled age.



Club of Rome（1972）

Past Technologies

Progress in production, and toward quantitative enhancement of man's abilities

hands → machinery

legs → transportation

eyes, ears → media

brain → computer

"Superman" Technology

As a matter of course, Superman expends a huge amount of energy.

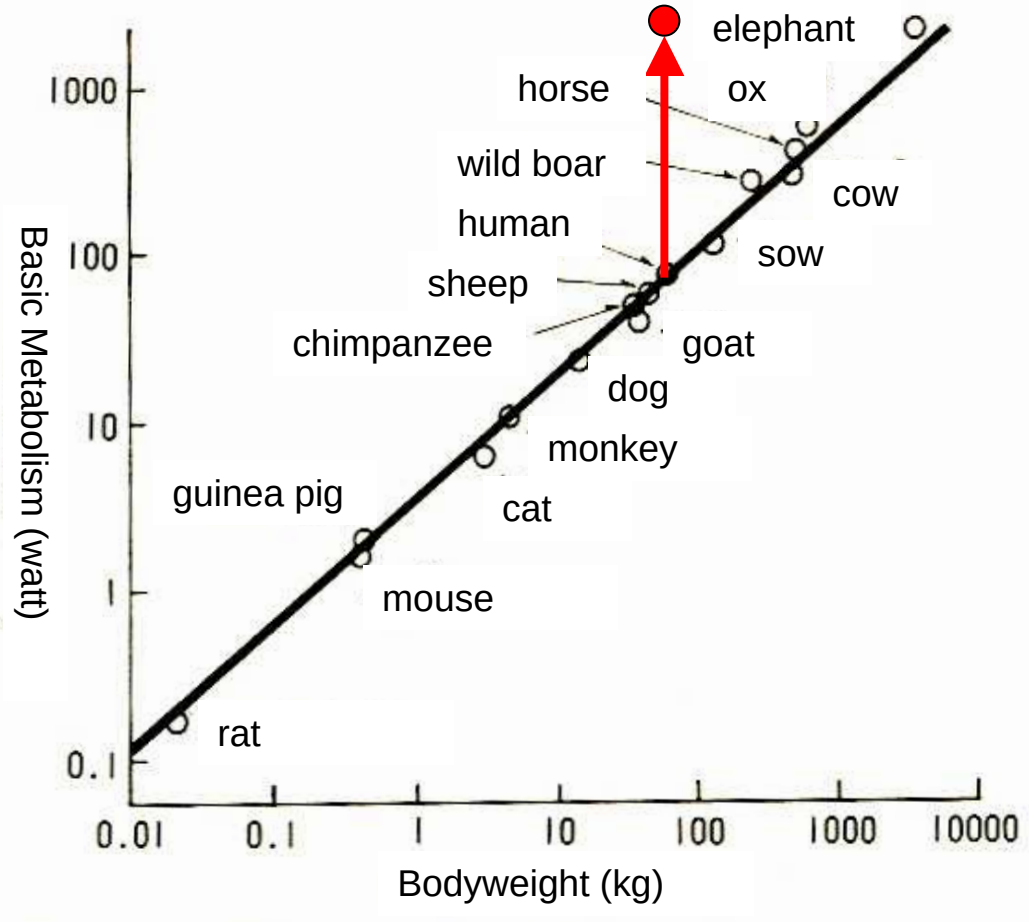


Fig.3-1 Relationship between metabolism and bodyweight (mammals). The unit of basic metabolism is the watt. The watt is equal to one joule of energy per second.

Tatsuo Motokawa "Time of the Elephant, Time of the Rat" Chuko Shinsho

Energy consumption at rest is proportional to the power 3/4.

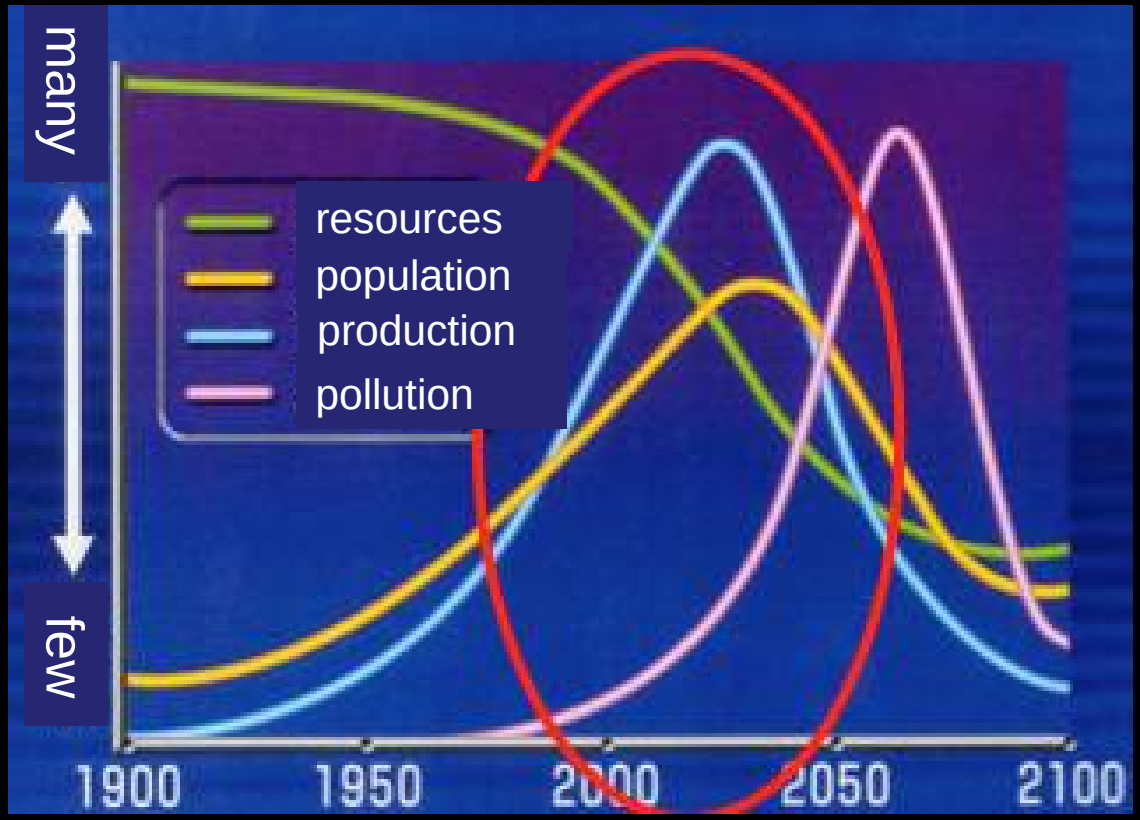
Population Explosion on Earth

In the late 21st century, population on the Earth will rise above 10 billion.

America	3 billion
Japanes	5 billion
developing countries	10 billion

The American model of mass consumption does not work in the 21st century.

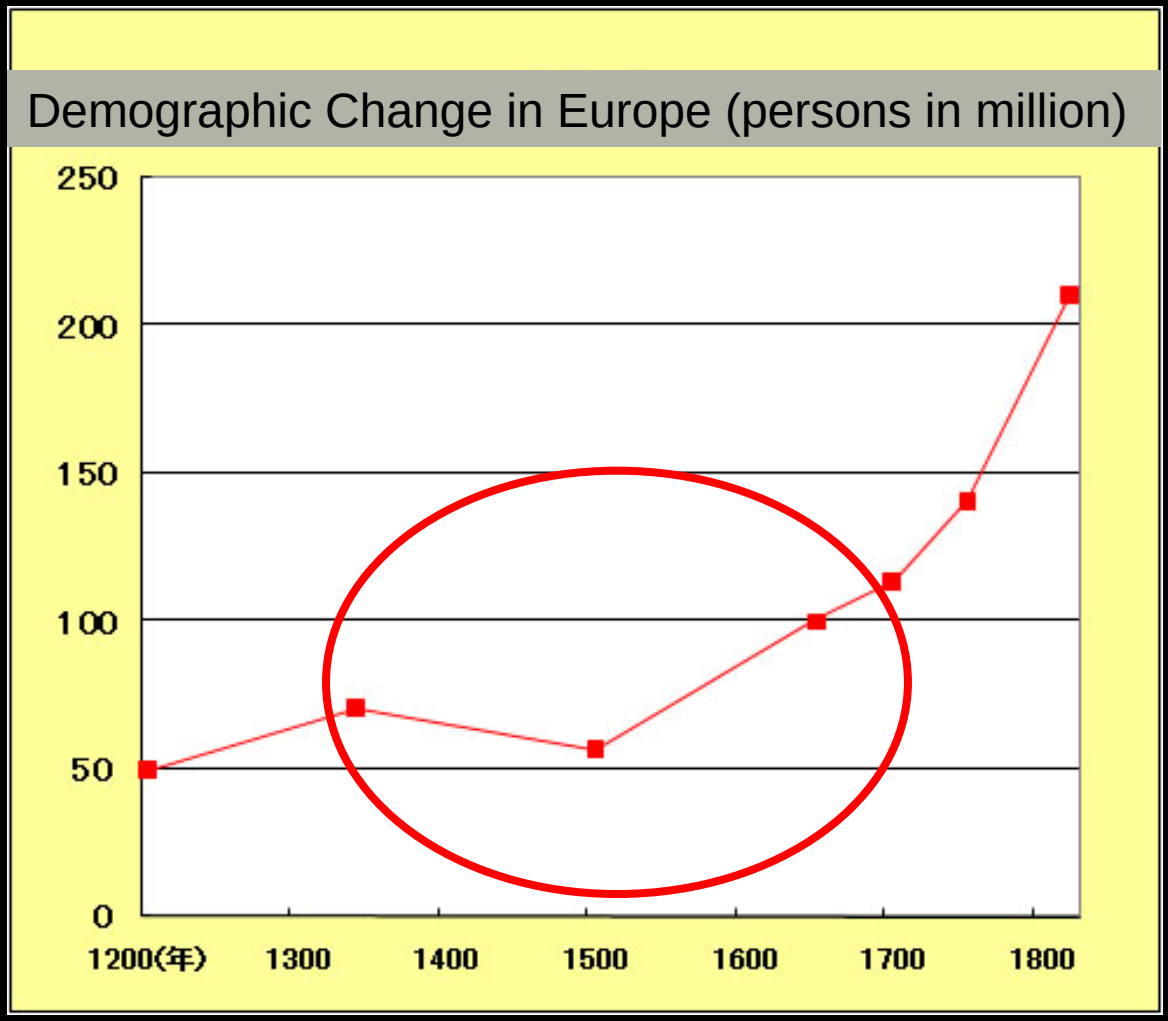
Maybe,
a history book
1000 years from now
would describe
the modern age as follows:



‡ Donella H. Meadows “Limits to Growth” DIAMOND, Inc. 1972 Chart41, p121

The 20th Century and the early 21st Century was the bubble age. The Industrial Revolution provided humans with technology to consume the earth resources in industrial production. Humans prospered in this period by chewing up the Earth. Humans had to deal with the aftermath of this bubble age in the late 21st Century.

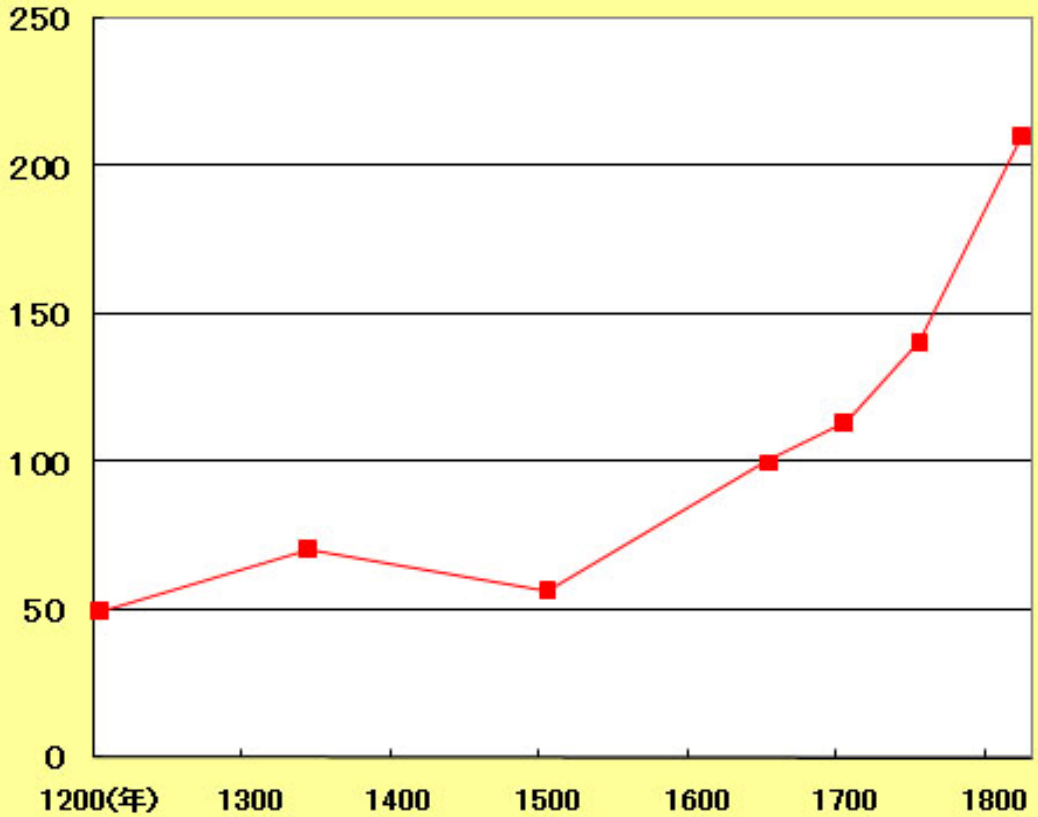
Has such a bubble and its subsequent collapse ever occurred in the past？



It happened in the 14-15th centuries!

Chart：Terry G. Jordan - Bychkov “The European Culture”

Demographic Change in Europe (persons in million)



The European economy developed steadily in the 12th and 13th Centuries, but change came in the 14th and 15th Centuries. Climate instability - cold temperature and heavy rains, poor harvests, starvation, war, and epidemics - devastated European societies. Population decreased and villages vanished one after another. The 14th and 15th Centuries were the worst age in European history. During this collapse, the social structure of Europe underwent a great change.

“VISUAL HISTORY OF THE WORLD” TOKYO HOREI PUBLISHING CO.,LTD.

Medieval time

4-10th Century
Started with volkerwanderung
Germanean
Normanean

11-13th Century
Enhancement of Vaticanism
Agricultural technology revolution

Reclamation of the continent led by the churches and monasteries

14-15th Century
Destruction of the ecosystem
Plague epidemic
Famine, Wars

Modern times

15-17th Century
Started with geographical discovery

Spain, Portugal, Netherlands, France, England

18-20th Century
Prosperity of modern science
Industrial revolution

Wide development of the Earth led by industries

21st Century
Destruction of ecosystem, environment, energy risk
Starvation? War?

History repeats itself in the perspective of civilization.

Civilization has a life-span.

Acquisition of technology

↓

Improvement in productivity, population increase

↓

Waste of natural resources, environmental deterioration

↓

Depression in productivity, population decrease

↓

Starvation, epidemic, civil war

↓

The end of civilization

Period Division

Period of Woods and Prairies（Prehistoric Times）

The birth of humans - upright walking, food-gathering, hunting

Period of Cities（Ancient Times）

agriculture, cattle breeding, formation of cities

Period of Continents（Medieval Times）

volkerwanderung, reclamation of land, plague epidemic

Period of the Earth（Modern Times）

geographical discovery, global development, ecological destruction

Now, the modern age (the period of the Earth) is coming to an end.

What kind of age would come next?

The life-span of civlization began at the Tigris and Euphrates.

→ New civilization was built on newly found continents.

In modern times, we have built civilizations on the whole earth.
Now, there are no new continents on Earth.

So, what should we do?

After "The Period of the Earth" Comes "The Period of Space"

SF predicted the period of space.

Space boom (first landing on moon) in the late 20th century - was this a preparation?

Can technology catch up?
Is there a utopia in outer space?

If there are no new continents
(new planets supporting life) in the space, we have to look for a new continent on the Earth.

One possibility is the construction of "a new information continent" that needs no resources or energy.

The information boom from the late 20th century to the early 21st century was perhaps a preparation for this.

In any case,
what we need now is
“ technology to
sustain the Earth”.

toward a perfect
recycling-based society

Information technology could be a key technology to sustain the Earth.

Networking all the contents on the Earth

↓

Networking all the “materials” on the Earth

A perfect network for energy and resources saving

→ Realize perfect recycling

→ Stop wasting energy

Our history book 1000 years from now might say …

In the 20-21st century, development of information technology was thought to have nothing to do with energy and resources.

However, there was a close relationship between information technology and energy.

In the 21st century,
challenged to sustain the Earth by information technology, people succeeded in constructing "a New Continent of Information" that consumes neither raw materials nor energy.

However…

Would this be a real solution?

Maybe, this is only a temporary life extension.

There might be something of greater Importance.

The important thing now is to change the quality of civilization.

Let’s look back at history again.

How is the beginning of the modern age written up in history textbooks?

II The Modern Society

Kinji Hidemura “World History” Gakuseisha

‡

During the transition from medieval times to modern times, there were great changes in the conception of human beings and their values.

Renaissance, Religious Reformation

Thoughts and philosophy which become leading principles in the next period prosper in revolutionary times.

Period Division

Period of Woods and Prairies（Prehistoric Times）

The birth of humans – upright-walking, food-gathering, hunting

Period of Cities（Ancient Times）

agriculture, cattle breeding, formation of cities

Hellenic culture, Roman culture, 3 major religions

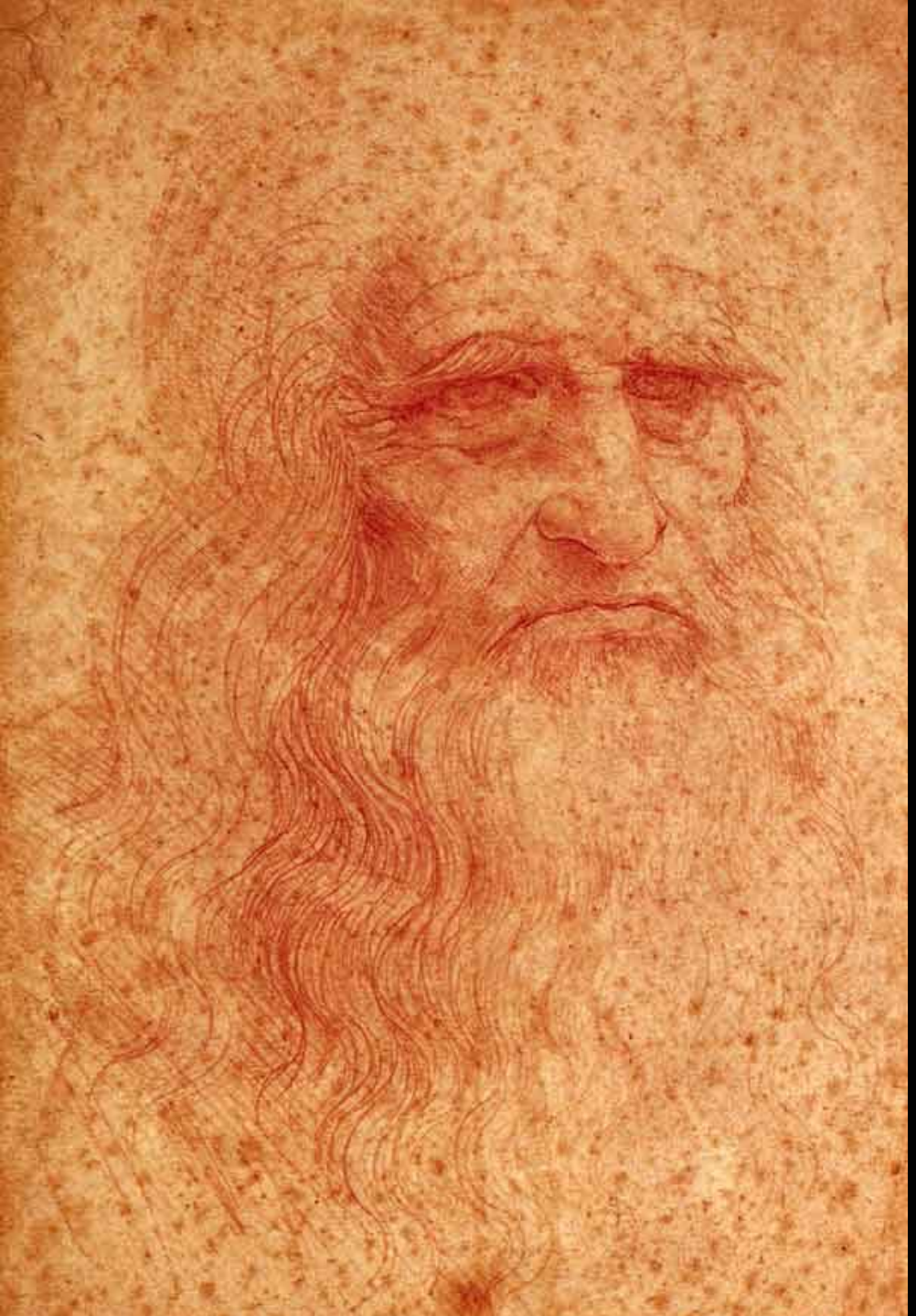
Period of Continents（Medieval Times）

volkerwanderung, reclamation of land, plague epidemic

Renaissance, religious reformation, modern rationalism

Period of the Earth（Modern Times）

geographical discovery, global development, ecological destruction



Leonardo Da Vinci

(1452－1519)

a man who had both vast knowledge and deep sensitivity

vast knowledge

overview of the wide scope of life

deep sensitivity

Knowledge and correct judgment of beauty and goodness

Now, the world again needs someone who can combine total knowledge and sensitivity.

A question.

Can anyone be a Da Vinci now?

Leonardo Da Vinci could have
both vast knowledge and deep sensitivity
because he lived 500 years ago.

This is impossible now!

Da Vinci Today

No one person can be a Da Vinci today.

But if experts from various fields collaborate, they can be Da Vinci as a group.

It is the age for a
Da Vinci group.

A University composes a group of knowledge.

If there is a system for whole campus collaboration, a university can be a Da Vinci.

A new academic institution where humanities and sciences cross each borders

The University of Tokyo

Interfaculty Initiative in Information Studies

(Founded in 2000)

People in iii

Humanities
sciences
fine arts
non-classified
…

Kang Sang-jung

social thought

Ken Sakamura
TRON, ubiquitous computing

Yoichiro Kawaguchi
CG artist

Katsushi Ikeuchi
computer vision

Osamu Sudoh

electric society

Shunya Yoshimi
cultural studies

Osamu Sakura

evolutionary biology

Shin Mizukoshi
media studies

And more …
Junichi Hamada／Tohru Nishigaki／Hidetaka Ishida／Akira Baba／Yuhei Yamauchi ／Masato Ishizaki…

For the new “scuola”

“Scuola d’Atene” Rafaello
Vatican, Stanza della Segnatura, Rome

Summary

Progress in information technology gave birth to new thoughts and philosophy.

- Ancient times→Medieval times
  - Invention of paper（BC2）
  - 3 Major Religions（Buddhism, Christianity, Islam)
- Medieval times→Modern times
  - Gutenberg printing press（1447）
  - Renaissance, Reformation, Modern rationalism
- Modern times→？？
  - Computer（1946）, Internet（1969）
  - ？？？？？

Information technology such as the internet will create new values.

Environment get ready.

You are the next leaders.

End

Thank you for listening to these 3 lectures.

Dr. Fujiwara, Dr. Yoshimi,
Dr. Tanaka, Dr. Kitsuregawa

and Ms. Otaki

Thank you!