

Japanese Contributions in Modern Astronomy

- Conditions for the development of astronomy -

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□. Introduction

Some statistics : Number of papers

	# of Papers in ApJ	# of Papers of Japanese authors in ApJ	# in PASJ	# of society Members
1972	582	9	38+12	403
2002	1707	201	108+19	1445

□. Introduction (continued)

- 1) Modern astronomy **started in 1877** when the astronomy department was established in the University of Tokyo, the first modern university in Japan.
- 2) After 130 years, Japan contributes **nearly 10 % of the modern astronomy.**

Questions:

- (1) Why have Japan attained the present position so quickly?
- (2) Why are Europe and North America still good in astronomy compared with other districts?

Hypotheses

Conditions for the development
of Astronomy (science) in a
country

(1) The amount of budget

(monetary resources)

(2) Background population

(human resources)

(3) The number of Posts in astronom

$$N = \text{Const.} \times B^{\alpha} \times P^{\beta} \times S^{\gamma}$$

. Japan as an example

□□Budget

□□Population increase

□□Number of Posts

□□Number of Society Members

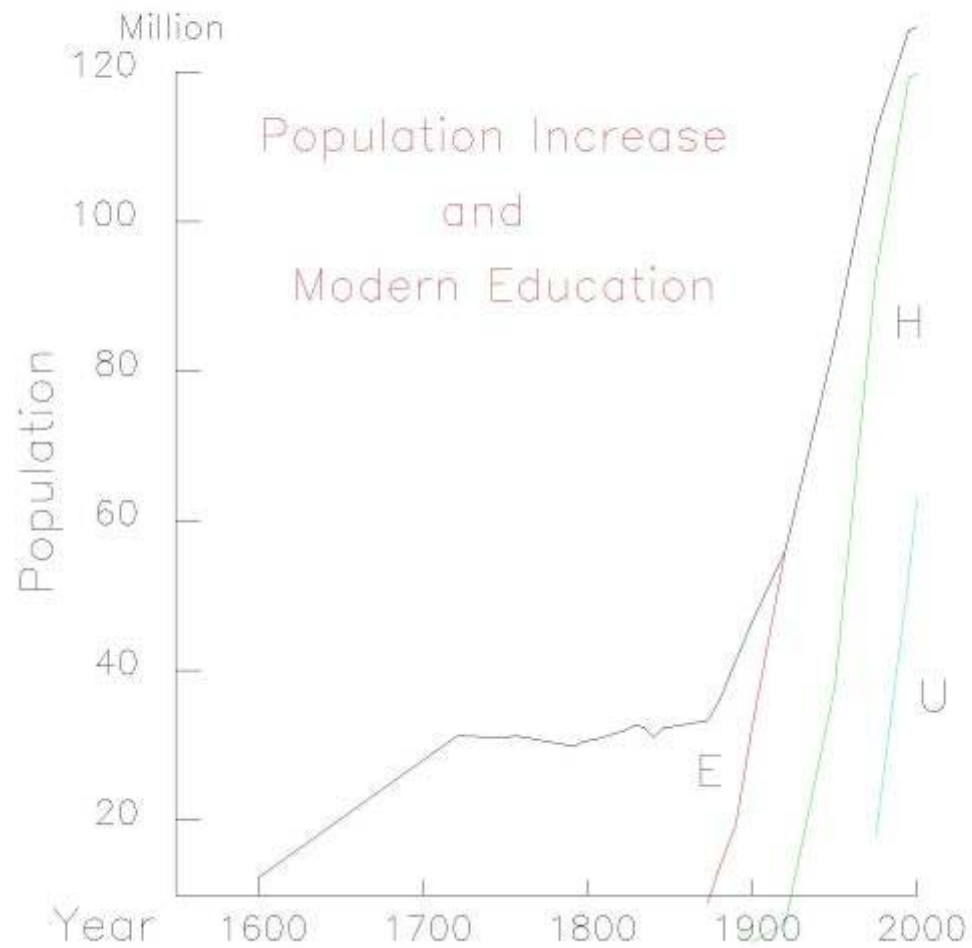
. Budget for Science (Yen, \square)

1970	3.659×10^{11}
1975	8.398
1980	13.401
1985	18.326
1990	22.970

\square Data taken from
MEXT \square

We should take into
account
general tendency of
inflation

3. 2 Population increase



Modern Education

E: Elementary school

H: High school

U: University or College

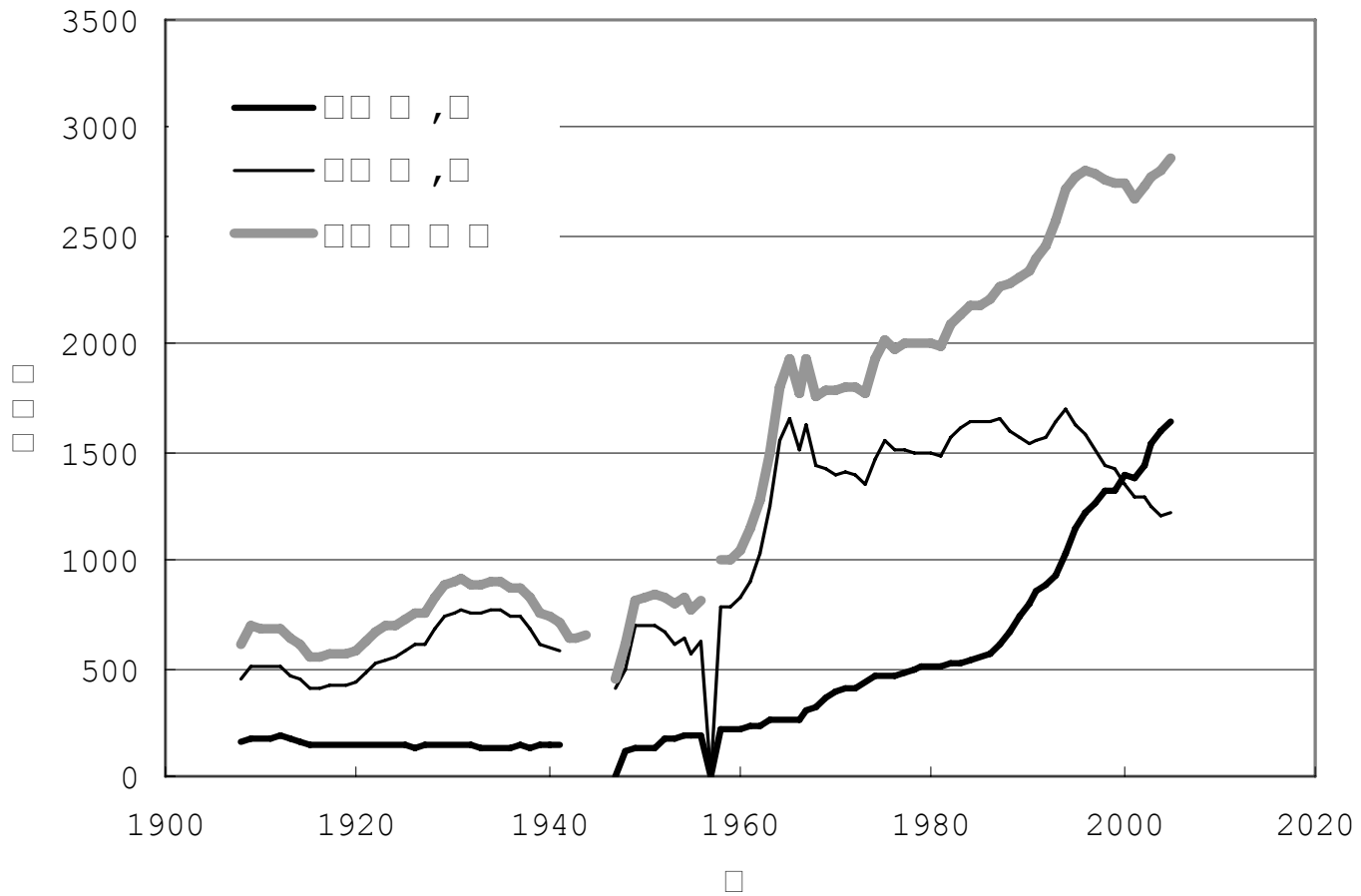
. Number of Posts

1950's □ 100

2000 around 500

3. 4 Number of Society Members

(M. Kondo, 2007)



. Fitting

α , β , γ and 1972 as the starting year.

In 2002,

B

Highschool to University 15% (1972) and
55 % (2002)

$P=3$

$S=4$

$$B * P * S = 36$$

We have $N = 1/6 B * P * S (= 6.6)$

4. Discussions

1. **How to estimate background population?**

Social ranks, Taboos, restrictions, literacy.

In Japan before 1868,

Farmers occupied 90 % of the population.

Education for most of the people were elementary.

In the case of Japan, estimates of three quantities

(budget, population, posts) are rather easy.

4. Discussions (continued)

2. How to do international comparisons?

We need to be careful when we estimate the budget and background population because of international flows.

Examples:

Human resources flow into USA.

Human resources flow out from small European countries.

Monetary resources flow into UK.

Thank you !

Poor JAPAN in the early 1950s

