Science 1000 (Wareham):
Computing in the 20th Century and Beyond:
A Survival Guide

Date   **Topic**

Mar 19   Getting Here: The First Computers (pre-1940)
Mar 21   Getting Here: The Rise of the Machines (1940–1970)
Mar 24   Getting Here: The Networked Society (1970–now)
Mar 26   Where We Are: On-line Life
Mar 28   Where We Are: Big Data and Privacy
Mar 31   Where We Are: Artificial Intelligence
Apr 2   Where We're Going: The Wild Blue Yonder
Apr 4   Section quiz

Science 1000 (Wareham): Computing in the 20th Century and Beyond: A Survival Guide

Almost all quizzed material will be in the on-line course notes, with the remainder coming from the lectures. The section quiz will be out of 50 marks and will have the following question format:

- True/False (12 marks)
- Match inventors to technology (8 marks)
- Match technology to decade (8 marks)
- Fill in the blank (12 marks)
- (Very) short essay questions (10 marks)

Science 1000: Part #1 (Wareham):

Getting Here:
The First Computers (pre-1940)

WHAT IS A COMPUTER (REALLY)?

WHAT WERE THE FIRST COMPUTERS?

What *is* a Computer? (Take I)

numbers $\longrightarrow$ **calculator** $\longrightarrow$ **results**

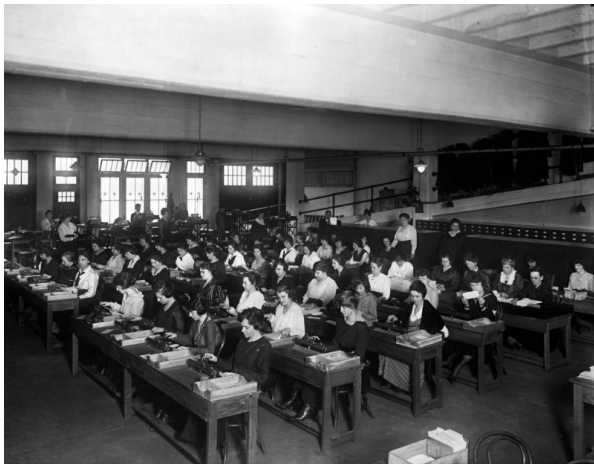# The First Computers

Nicole-Reine Lepaute
(1723–1788)

Gertrude Blanch
(1896–1996)

The First Computers (Cont'd)

- From the early 1600's until the 1930's, a computer was a person who performs calculations, *i.e.*, computes.
- Early human computing was done for problems in astronomy, *e.g.*, the 1758 return of Halley's comet (Alexis-Claude Clairaut, Joseph-Jerome Lelande, and Nicole-Reine Lepaute (1757)).
- Computing subsequently used to compute various mathematical tables used in navigation (Nevil Maskelyne: *Nautical Almanac* (1766–now)), surveying (Gaspard de Prony: *Tables du Cadastre* (1790–1801)), and the insurance industry.
- Computers worked at home separately or together in organized groups.
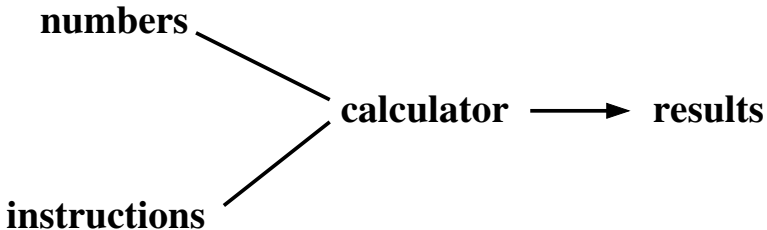
The First Computers (Cont'd)

Mechanical Computers (Cont'd)

- Many aids to human calculation throughout history, *e.g.*, writing, abacus, quipu, slide rule.

- True mechanical computers emerged in the 17th century, *e.g.*, the 1642 addition machine of Blaise Pascal (1623–1662).

What *is* a Computer? (Take II)

numbers

instructions

calculator $\longrightarrow$ **results**

Overall speed of calculation can only increase if input,
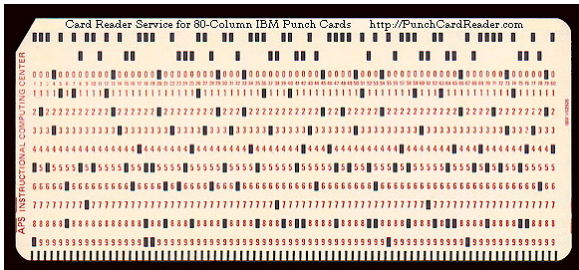calculation, and output operations **all** undergo **same**
increase in speed.

Mechanical Computers (Cont'd)

- Specification of weaving pattern by punch cards in Jacquard loom (1802).
- Used as computation control mechanism by Charles Babbage (1791–1871) in his uncompleted Difference and Analytical Engines.

Mechanical Computers (Cont'd)

- Storage of data on punch cards (Herman Hollerith (1859–1929)).

- Success in 1890 U.S. census parlayed by Thomas Watson Sr. into International Business Machine (IBM) empire.