

# Technological Progress

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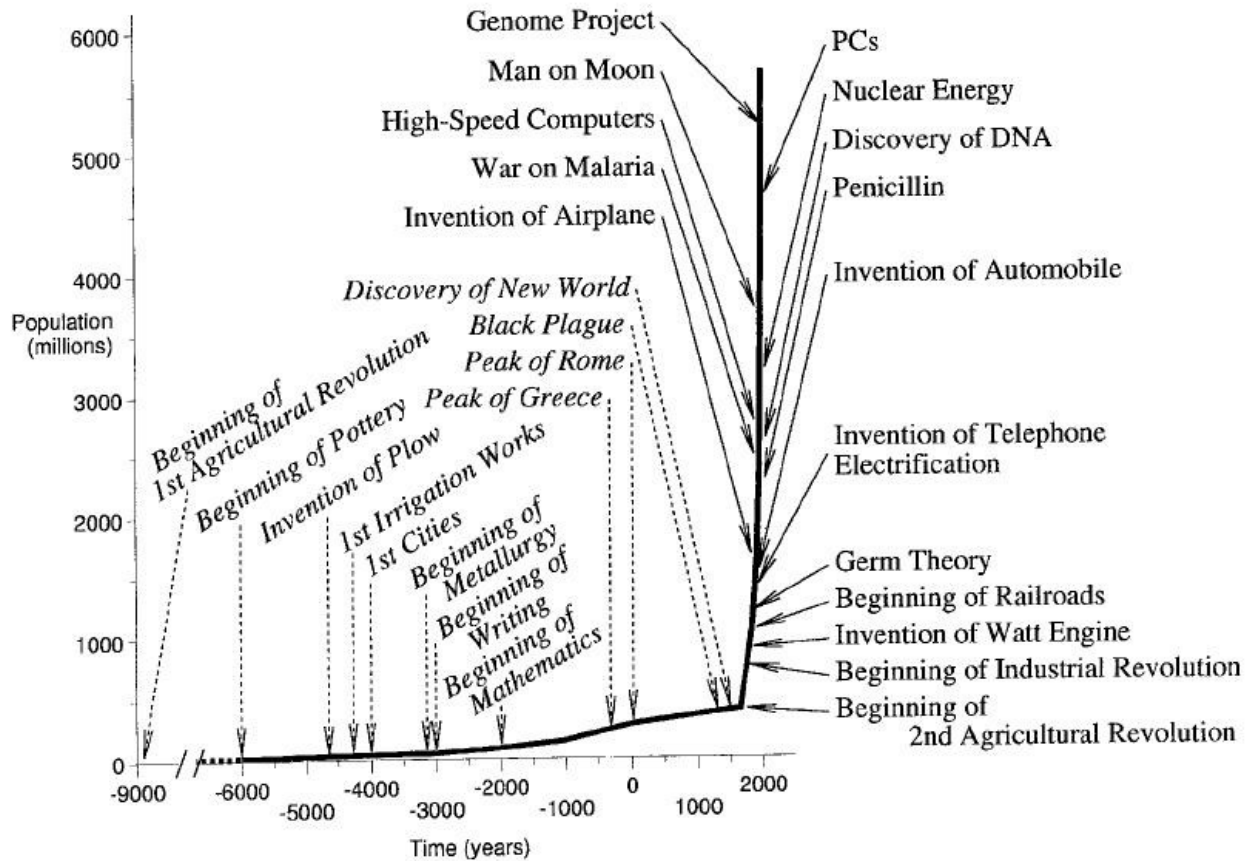


FIGURE 1. THE GROWTH OF THE WORLD POPULATION AND SOME MAJOR EVENTS IN THE HISTORY OF TECHNOLOGY

*Notes:* There is usually a lag between the invention of a process or a machine and its general application to production. "Beginning" means the earliest stage of this diffusion process.

*Sources:* Carl W. Bishop, 1936; T. K. Derry and T. I. William, 1960; Graham Clark, 1961; B. H. Slicher von Bath, 1963; Stuart Piggott, 1965; Glenn T. Trewartha, 1969; William McNeill, 1971; Jacob Bronowski, 1973; Carlo M. Cipolla, 1974; B. M. Fagan, 1977. See also E. A. Wrigley, 1987; Robert C. Allen, 1992, 1994.

# Ancient World

**1,000,000 B.C.**

Patterned tools

**360,000 B.C.**

Camp fire

**9,000 B.C.**

Agriculture

**6500 B.C.**

Wheel

**3500 B.C.**

Fixed Wheels on Carts (Chariots)

(first wheeled vehicles in history)

Riverboats

**2600 B.C.**

Abacus

**2000 B.C.**

Horses are domesticated

(and used for transportation)

**1700 B.C.**

Windmills

**1450 B.C.**

Sundial

**700 B.C.**

Musical notation

Gunpowder

**184 B.C.**

Early books

**100 B.C.**

Astronomical calculator

**180**

Wheelbarrow

**700**

Block printing

**770**

Iron Horeshoe

# Medieval

**1335**

First public clock

**1455**

First Gutenberg Bible

**1485**

Leonardo DaVinci designs the first parachute

**1495**

First bomb

# 1500-1700

**1514**

First bullet

**1590**

Compound microscope

**1609**

Galileo's Telescope

**1621**

First blast furnace

**1650**

First air pump

**1656**

Pendulum clock

# 1700-1900

**1700**

Steam boilers

**1760**

Benjamin Franklin invents the bifocal lens

**1765**

Steam engine

**1796**

Inoculation/vaccination

**1800**

First suspension bridge

**1801**

First electric arc lamp

**1804**

Steam-powered locomotive

**1819**

Stethoscope

**1837**

Telegraph

**1839**

Daguerreotype camera

Vulcanized Rubber

**1846**

Sewing Machine

**1860**

Pasteurization

**1867**

Dynamite (Alfred Nobel)

**1876**

Thomas Edison 's incandescent bulb

Alexander Graham Bell invents the telephone

**1877**

Edison 's gramophone and phonograph

**1885**

Benz's automobile

**1886**

Coca Cola

**1888**

Eastman's camera

**1893**

Edison's "movies"

**1895**

X-Rays

**1899**

Tape recorder

# 1900-1949

## 1900

Zeppelin

Escalator

## 1901

Vacuum Cleaner

Assembly Line

Radio

## 1903

Wright's aeroplanes

## 1904

Ice Cream Cone

Radar

## 1905

Theory of Relativity (Einstein)

Popsicle

## 1907

Paper Towels

## 1912

Shopping Bag

## 1913

Henry Ford: Auto Mass  
Production

## 1917

Christmas Lights

## 1920

Band-Aid

Traffic Lights

Hair Drier

## 1923

Hearing aid

## 1924

Liquid fueled rocket

## 1926

Warner Bros' Sound

Movies

## 1927

Television

Pez

## 1928

First differential analyzing  
computer

Bubble Gum

Yo-yo

## 1932

Electron Microscope

## 1935

Ballpoint Pen

## 1938

Monopoly

Nylon Stockings

## 1940

Modern Helicopters

## 1942

Nuclear Reactor

Duct Tape

## 1944

Blood Banks

## 1945

Microwave Oven

Tupperware

Atomic Bomb

## 1946

Disposable Diapers

The Bikini

## 1947

Transistor

Holography

Instant Photography

First Supersonic Flight

Kitty Litter

## 1948

Scrabble

Velcro

## 1949

LEGO

# 1950-1970

## 1950

Credit Card  
Frisbee

## 1951

Business Calculator  
Liquid Paper

Superglue

## 1952

Mr. Potato Head  
Diet Soft Drink  
Hydrogen Bomb

## 1953

Black Box (airplanes)  
Radial Tires

## 1954

Milk Carton  
Oral Contraceptives  
Non Stick Pan  
Solar Cell

McDonald's

## 1955

Fiber optics  
TV Remote Control

## 1956

Computer Hard Disk  
Scotch Guard

## 1957

Soviets send Sputnik to Space  
Fortran

Aluminum Cans for Soft Drinks

## 1958

Integrated Circuit  
Hula Hoop

Modem

## 1959

Microchip  
Internal Pacemaker

Barbie Doll

## 1960

Laser  
Halogen Lamp

## 1961

Valium

## 1962

Audiocassette  
Silicon Breast Implants  
"SpaceWar" (first computer game)

## 1963

Videodisc

## 1964

Acrylic Paint  
BASIC

## 1965

Hand Held Calculator  
Astroturf

Soft Contact Lenses  
Compact Disc

Nutrasweet

## 1966

Electronic Fuel Injection

## 1968

Computer Mouse  
Microprocessor  
RAM (Random Access Memory)

## 1969

First Man on Moon (Apollo XI)  
Arpanet (first internet)

Artificial Heart

ATM

## 1970

Bar Code Scanners  
Liquid Crystal Display (LCD)  
Floppy Disk  
First Jumbo jet (Boeing 747)



# 1971-1995

## 1971

Kevlar  
Dot matrix printer  
food processor  
VCR

## 1972

Compact disc  
Word Processor

## 1973

Ethernet (local computer network)  
Disposable Lighter (BIC)  
Gene Splicing

## 1974

Post It Notes  
Rubik's Cube  
Liposuction

## 1975

Betamax and VHS  
Laser Printer

## 1976

Ink Jet Printer

## 1977

Apple personal computer  
PC Modem  
Magnetic Resonance Imaging  
(MRI)

## 1978

VisiCalc (First Spreadsheet)  
Jarvik-7 (artificial heart)

## 1979

Cel.lular Phones  
Cray Supercomputer  
Walkman  
Roller Blades

## 1980

Hepatitis-B vaccine

## 1981

MS-DOS  
IBM-Personal Computer  
Space Shuttle

## 1982

Human Growth Hormone genetically  
Engineered

## 1983

Soft Bifocal Lenses  
Cabbage Patch Kids  
Virtual Reality

## 1984

CD Rom  
Apple Macintosh

## 1985

Microsoft Windows

## 1986

High Temperature Superconductor  
Synthetic Skin  
Disposable Camera (Fuji)

## 1987

3-D video games  
Disposable Contact Lenses

## 1988

Digital Cellular Phones  
Dopple Radar  
Prozac  
RU-486 (abortion pill)

## 1989

High Definition TV

## 1990

HTML and HTTP Protocol (WWW)

## 1991

Digital Answering Machines

## 1992

Smart Pill

## 1993

Pentium

## 1994

HIV Inhibitors

## 1995

Digital Versatile Disc (DVD)  
JAVA

# 1996-2000

**1996**

Web TV

**1997**

Gas Powered Fuel Cells

Teletubbies

**1998**

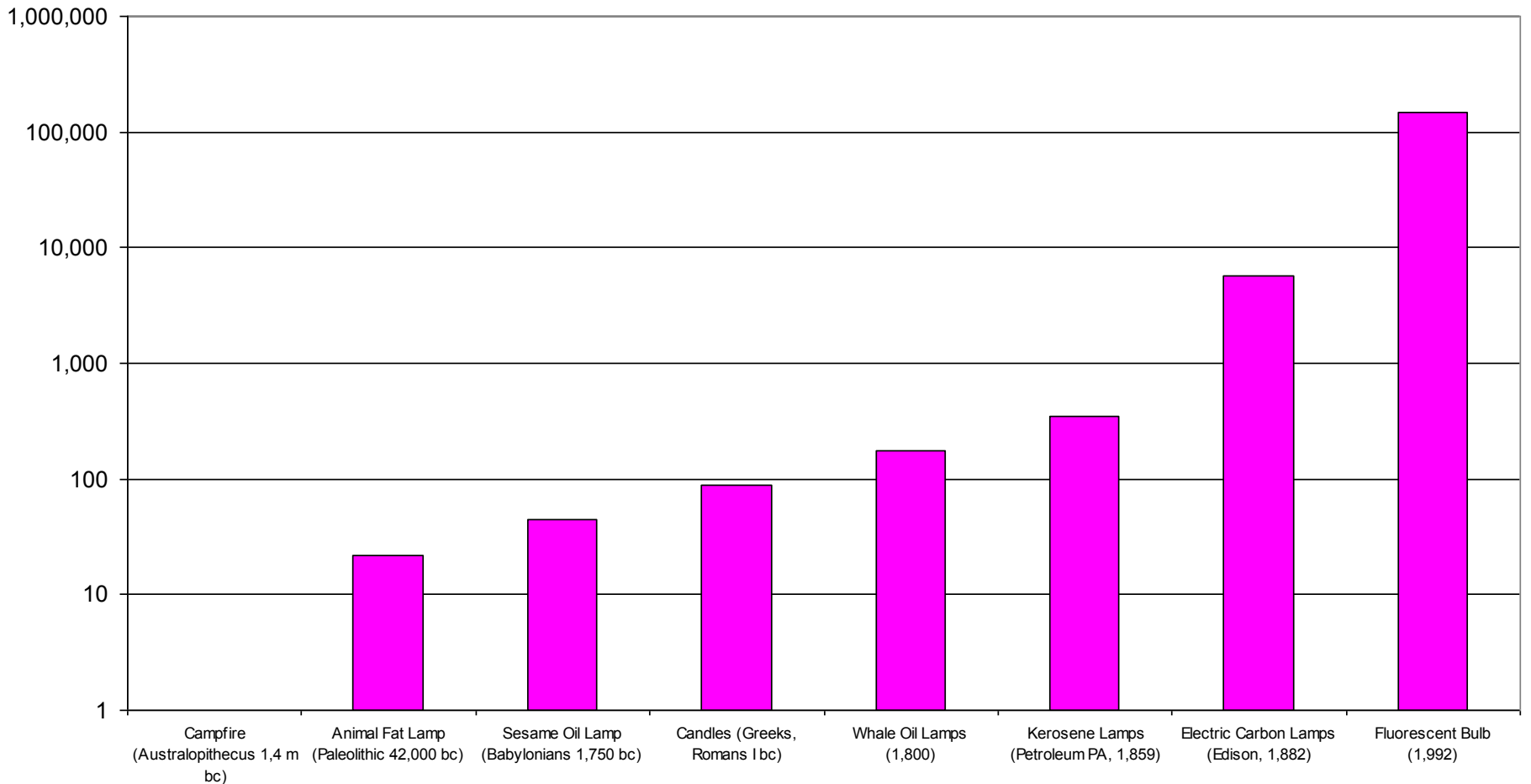
Viagra

**2000**

Dolly the cloned sheep

# History of Light

Lighting Power Per Unit of Energy



# Per Hour of Work

- With ONE HOUR OF WORK
  - We can purchase 840,000 time more light than the australopithecus
  - We can purchase 45,000 times more light than the XVIII man
- Inventions that lower the price of things matter a lot!!