

Technological Progress

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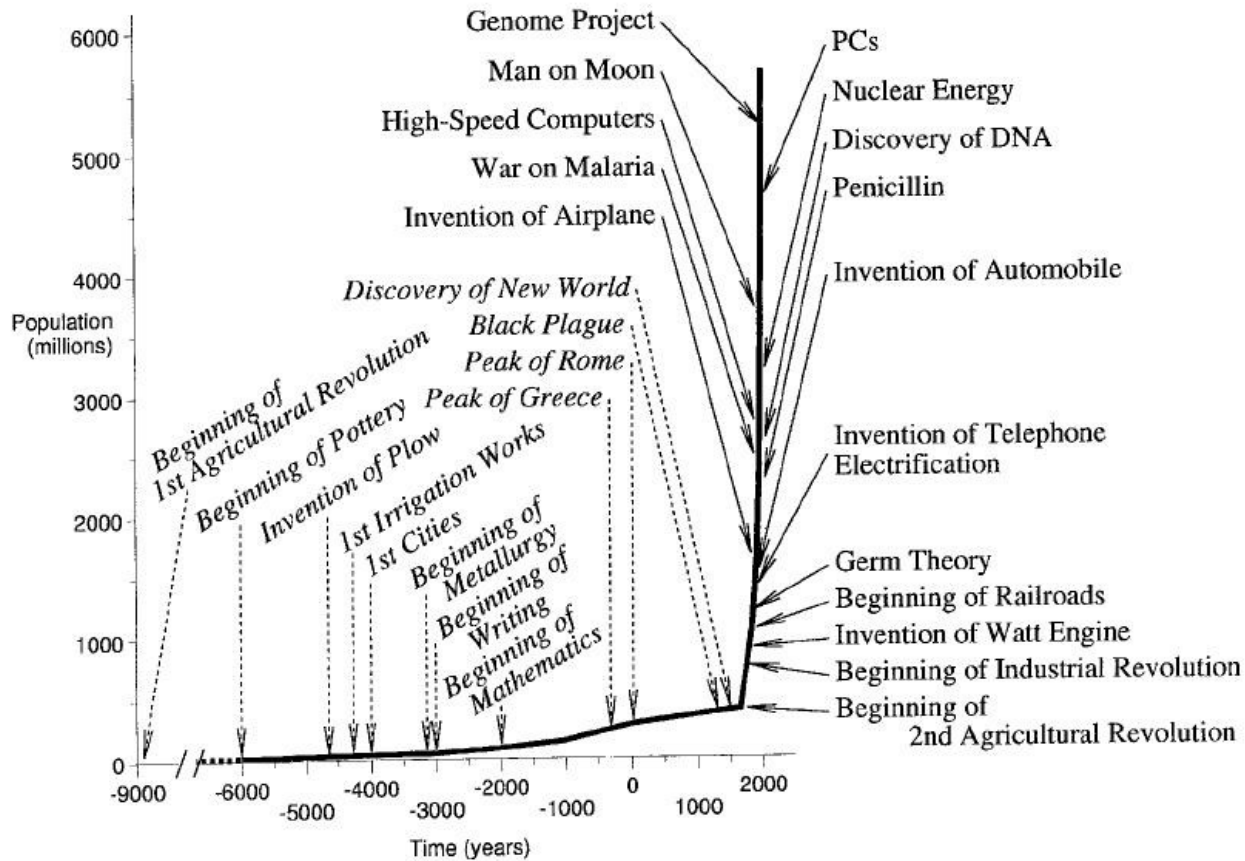


FIGURE 1. THE GROWTH OF THE WORLD POPULATION AND SOME MAJOR EVENTS IN THE HISTORY OF TECHNOLOGY

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

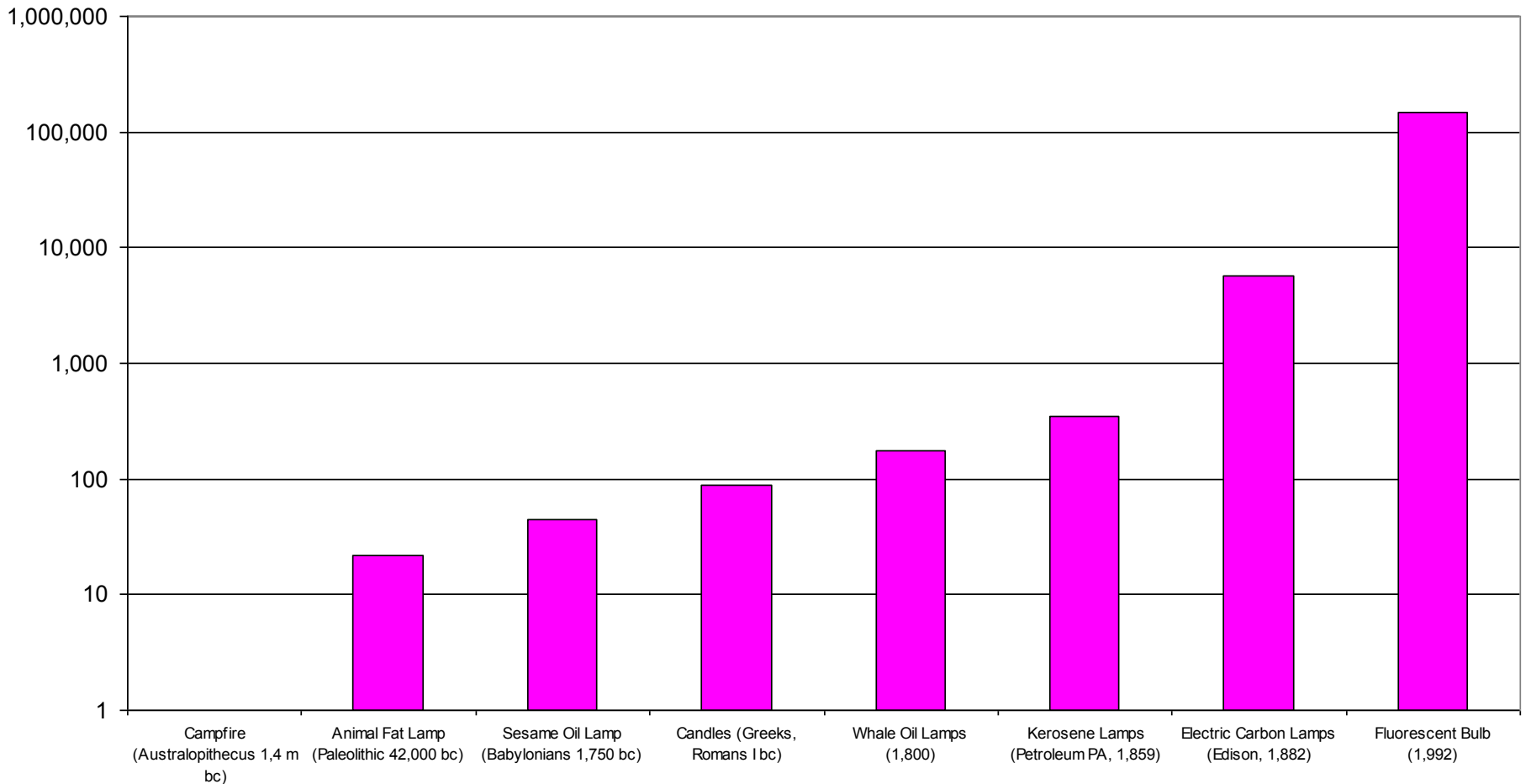
Viagra

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!!