

History of Engineering

1	Food-Producing Revolution	6000 - 3000 B.C.
2	Appearance of Urban Society	3000 - 2000 B.C.
3	Birth of Greek Science	600 - 300 B.C.
4	Revolution in Power	Middle Ages
5	Rise of Modern Science	17 th century
6	Steam and the Industrial Revolution	18 th century
7	Electricity and Applied Science	19 th century
8	Age of Automatic Control The Information Age	20 th century
9	The Biotechnology Revolution	21 st century

Engineering & History



1 تسلسل الرسل عليهم جميعاً السلام

هبط آدم بالسفوف وحواء بالمرورة وقيل أيضاً هبط بالهند (جزيرة يندريب، سيلان) وقيل أيضاً أهبط آدم بالهند وحواء بجدة واجتمعوا في المؤنفة دفن آدم في جبل أبي قيس وقيل حملة جبريل عليه السلام إلى جبل عرفات ونوفي دفن عند سفح جبل أبي قيس

ولد إدريس بمصر وقيل ولد ببابل وهاجر إلى مصر ، أنشئت في زمانه 188 مدينة.

قوم نوح جنوبي العراق (الكرنة)

مساكن عاد في أرض الأحقاف، شمال حضرموت ، قوم يعقوب الأثريان وقوم عاد الذين هلكوا هم عاد الأولى ، أما عاد الثانية فهم سكان اليمن وقيل هم ثمود

ديار ثمود منطقة تيماء مدائن صالح والملا

ولد بنحو العراق، استقر بمدينة كور، بعد محاولة حرقه بكنوزي ، سافر مع سارة إلى حاران ثم فلسطين ، انتقل إلى مصر ثم إلى جنوب فلسطين (أرض السبع) ، سافر مع زوجته هاجر وأبنة اسماعيل التي حكاه تكوت وولادته بين مكة والخيل وفي إحدى الزيارات أمر الله إبراهيم وإسماعيل ببناء الكعبة ، ثم عاد إلى الخيل ومات ودفن بها.

1 آدم
2 إدريس
3 نوح
4 هود
5 صالح
6 إيزاهيم
7 حواء
8 ز
9 سارة
10 ز
11 هاجر
12 إسماعيل
13 إسحاق
14 يعقوب
15 مدين

أول من تلقى بالحرية

نحو 1800 قبل الميلاد

1

Food producing revolution 6000 - 3000 B.C.

- Hunters and gatherers
- Nomadic tribes
- Sparse populations
- No towns, villages, cities

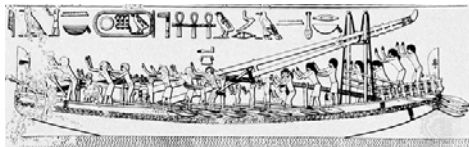
Crude tools, pottery, ornaments.



Ibrahimi Mosque - Tombs of Ibrahimi - Hebron



2



2

Appearance of urban society 3000 - 2000 B.C.

- Appearance of cities; Egyptian society
- Rise of Egypt as an (incredible) engineering society
 - Driven by class society and need for infrastructure to support.
 - Also driven by pharaohs of time;
 - Great Pyramid of Cheops (From about 2700 to 2500 B.C.); 2.3 million cut blocks weighing 5,000 pounds each. Pyramid stands 481 ft high. Joints less than 0.02 inches in width
 - Precision cutting, measurement devices, irrigation, asphalt roads(!)

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Great Pyramid
2700-2500 B.C.

Gardens of Babylon
600 B.C.

Temple of Artemis
550 B.C.

Statue of Zeus
457 B.C.

Mausoleum at Halicarnassus
353 B.C.

Lighthouse of Alexandria
270 B.C.

Colossus of Rhodes
200 B.C.

2

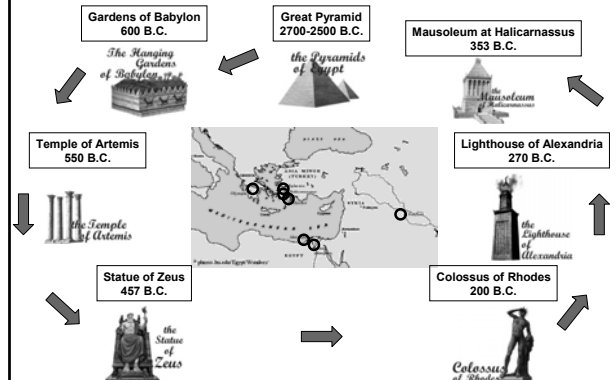
Appearance of urban society 3000 - 2000 B.C.

- Increase in wealth, extension of political power, growth in trade, required urban infrastructure, stimulated engineering
- Knowledge gained was empirical, gained from experience, and handed down to next generation



Chinese Dynasties






Seven Old Wonders of the World



Chinese Dynasties - 2

BC From: 221 To: 206	Ch'in Dynasty	A unified system of writing was developed	
From: 202BC To: 220AD	Han Dynasty	Year 200 Chinese invent paper	
From: 581 To: 618	Sui Dynasty	A time of prosperity and trade. Porcelain develops	
From: 618 To: 907	T'ang Dynasty	Acupuncture, a method of relieving pain using needles comes into use	
From: 960 To: 1217	Sung Dynasty		
	1217	Mongols attack China. Genghis Khan captures Beijing	

Chinese Dynasties - 1

BC 7000	Civilization develops in the Yellow River Valley	
BC 3500	Rice was cultivated	
BC 2000	Bronze weapons and silk making develop	
BC From: 1766 To: 1122	Shang Dynasty	
BC From: 1122 To: 256	Chou Dynasty	
BC 246	Work on the Great Wall of China begins	

Chinese Dynasties - 4

From: 1644 To: 1912	Ch'ing Dynasty		Tea is the most popular beverage in China
		1839	War with Britain over opium trading
		1851	Taiiping rebellion against the Manchus
1911	China becomes a republic		
1921	Chinese Communist party founded		
1989	Troops kill student protesters in Beijing's Tiananmen Square		

Chinese Dynasties - 3

1271	Yuan Dynasty		Kublai Khan establishes Yuan dynasty
From: 1279 To: 1368		1300	The Chinese build ships with watertight bulkheads
From: 1368 To: 1644	Ming Dynasty	1421	Emperor moves court to the Forbidden City in Beijing
			Great fleets of ships were sent abroad for trade
			Chinese porcelain is treasured all over the world

3

Birth of Greek Science 600 - 300 B.C.

- Engineering dominated by Greeks, Romans.
- Engineering knowledge acquired by conquest (development and refinement, not research)
- Greeks more mathematically rigorous (Aristotle, Archimedes) than Romans, although Romans considered better engineers.
- Accomplishments included, sophisticated roads and aqueducts, turbine engine, navigation, running water and sewage drainage, heated houses, public baths, etc.

3

Birth of Greek Science 600 - 300 B.C.

- Discovery of science
- Recorded scientific and philosophical knowledge
- Engineers and architects respected members of society
- Romans adopt Greek science and become master engineers (but rotten scientists)

4

Revolution in Power (Middle Ages)

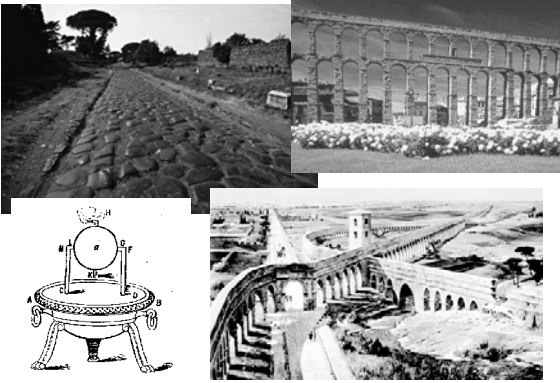
- 1st - 16th Centuries
 - Fall of Roman empire.
 - Engineering dominated by Arabs, Chinese, and Italians.
 - Accomplishments included paper, new smelting processes, waterwheels and windmills, movable type printing press, telescope, gunpowder

4

Revolution in Power (Middle Ages)

- Up to this time, power supplied by slave labor
- Engineers harness power from three sources
 - Animals (horses, oxen, etc)
 - Wind (windmills)
 - Water (waterwheels, watermills, dams)

5

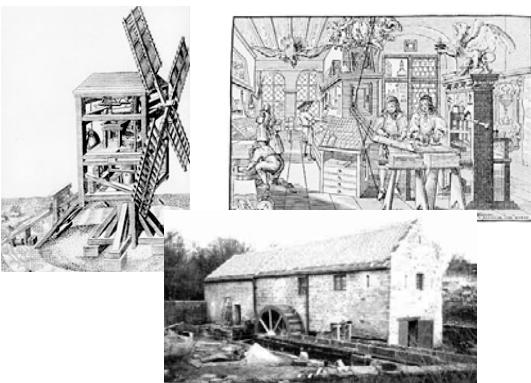


5

Rise of Modern Science 17th Century

- Rediscovery of Greek science
- Newton, Galileo, Descartes, etc. establish strong foundation
- Tools of science and engineering (telescope, microscope, barometer, calculus, analytic geometry, etc.)
- Truss and suspension bridges, canals, harbors, municipal engineering, pumps, etc.

5



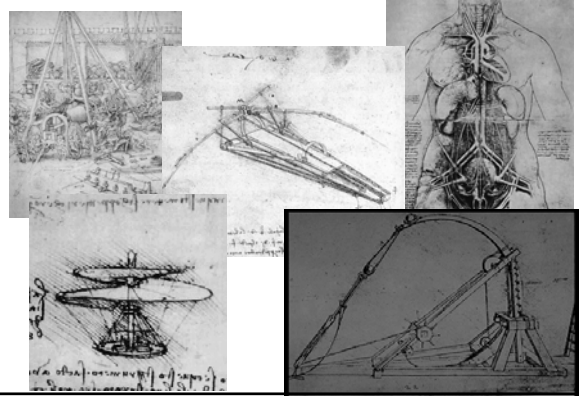
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- 17th and 18th Centuries
 - Dominated by Europe
 - Accomplishments included scientific and engineering methods, canals and locks, ship design, fundamental theoretical frameworks

6 Steam and the industrial revolution 18th Century

- Invention of the steam engine and industrial equipment
- Mass production, steam-powered transportation (locomotives and paddle wheelers) spurred growth in canals, bridges, roads, railroads
- Materials science, refined steel - bridges, transportation

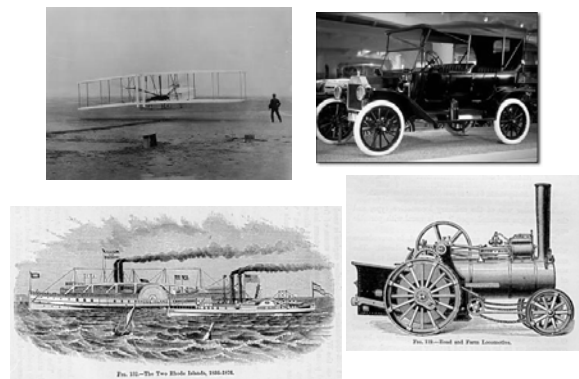
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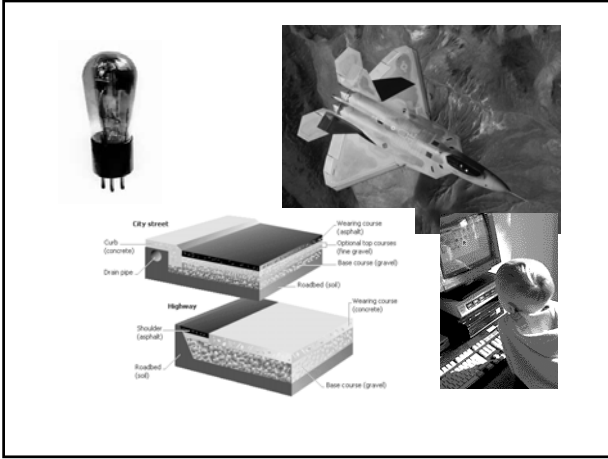


7 Electricity and the beginning of applied science (19th Century)

- "Rediscovery" of electricity and electromagnetism
- Electrical generation and distribution, batteries, telecommunications (telegraph)
- Skyscrapers
- 19th Century
 - Dominated by United States
 - Mass production, iron refinement, steam engine, railroads

6





80

Age of automatic control 20th & 21st Century

- Manned, powered flight
- Mass produced cars
- Information Age
 - Proliferation of computer technology
- Human Genome Project
- Genetic engineering
- Neural regeneration
- Bionics
 - Massive, almost exponential increase in scientific and engineering knowledge
 - Examples, Nylon, nuclear energy, solid state electronics, jet aircraft, lasers, satellites, space exploration