ANCIENT ENGINEERS pdf

1: Ancient Egypt Engineers

The Ancient Engineers is a science book by L. Sprague de Camp, one of his most popular www.enganchecubano.com was first published by Doubleday and has been reprinted numerous times by other publishers.

The earliest civil engineer known by name is Imhotep. The Antikythera mechanism , the earliest known model of a mechanical computer in history, and the mechanical inventions of Archimedes are examples of early mechanical engineering. In the Middle Ages, the Trebuchet was developed. Middle Era[edit] An Alibi by the name of Al-Jazari built five machines to pump water for the kings of the Turkish Artuqid dynasty and their palaces. Besides over 50 ingenious mechanical devices, Al-Jazari also developed and made innovations to segmental gears, mechanical controls, escapement mechanisms, clocks, robotics, and protocols for designing and manufacturing methods. Renaissance Era[edit] The first steam engine was built in by mechanical engineer Thomas Savery. The development of this device gave rise to the industrial revolution in the coming decades, allowing for the beginnings of mass production. With the rise of engineering as a profession in the 18th century, the term became more narrowly applied to fields in which mathematics and science were applied to these ends. Similarly, in addition to military and civil engineering, the fields then known as the mechanic arts became incorporated into engineering. The following images are samples from a deck of cards illustrating engineering instruments in England in They illustrate a range of engineering specializations, that would eventually become known as civil engineering , mechanical engineering , geodesy and geomatics , and so on. Each card includes a caption explaining the purpose of the instrument: Sea quadrant Nine of diamonds: Dyals dials Six of diamonds: Circumferentor Eight of diamonds: Spheres Knave of hearts: Surveying wheel and chains Knave of spades: Leavell One of diamonds: Mathematical instruments Queen of diamonds: Projections of the sphere Queen of spades: Astronomical quadrant Three of diamonds: Gauger gauges Two of clubs: The development of specialized machines and their maintenance tools during the industrial revolution led to the rapid growth of Mechanical Engineering both in its birthplace Britain and abroad. Electrical engineering became a profession late in the 19th century. Practitioners had created a global electric telegraph network and the first electrical engineering institutions to support the new discipline were founded in the UK and USA. Although it is impossible to precisely pinpoint a first electrical engineer, Francis Ronalds stands ahead of the field, who created the first working electric telegraph system in and documented his vision of how the world could be transformed by electricity. The later inventions of the vacuum tube and the transistor further accelerated the development of Electronics to such an extent that electrical and electronics engineers currently outnumber their colleagues of any other Engineering specialty. Early knowledge of aeronautical engineering was largely empirical with some concepts and skills imported from other branches of engineering. Meanwhile, research to provide fundamental background science continued by combining theoretical physics with experiments. The first PhD in engineering technically, applied science and engineering awarded in the United States went to Willard Gibbs at Yale University in ; it was also the second PhD awarded in science in the U.

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2: The Ancient Engineers - L. Sprague de Camp - Google Books

The Ancient Engineers has ratings and 26 reviews. Tatiana said: This is a really well-written book about the history of humankind as seen through the.

History of Civil Engineering written by: With advancement in all spheres of technology, civil engineering has also developed tremendously. Thus the history of civil engineering is closely associated with the history of advancement in these sciences. In ancient history, most of the construction was carried out by artisans, and technical expertise was limited. Tasks were accomplished by the utilization of manual labor only, without the use of sophisticated machinery, since it did not exist. Therefore, civil engineering works could only be realized with the utilization of a large number of skilled workers over an extended period of time. According to the historians, the Pyramids were constructed in Egypt during BC and may be considered as the first large structure construction ever. The Great Wall of China that was constructed around BC is considered another achievement of ancient civil engineering. The Romans developed extensive structures in their empire, including aqueducts, bridges, and dams. A scientific approach to the physical sciences concerning civil engineering was implemented by Archimedes in the third century BC, by utilizing the Archimedes Principle concerning buoyancy and the Archimedes screw for raising water. During the era of battles or operations, the engineers were engaged to assist the soldiers fighting in the battlefield by making catapults, towers, and other instruments used for fighting the enemy. However, during peace time, they were concerned mainly with the civil activities such as building fortifications for defense, making bridges, canals, etc. It was in the 18th century that the term civil engineering was firstly used independently from the term military engineering. The first private college in the United States that included Civil Engineering as a separate discipline was Norwich University established in the year Civil engineering societies were formed in United States and European countries during the 19th century, and similar institutions were established in other countries of the world during the 20th century. In was founded in with members related to the civil engineering profession located globally. The number of universities in the world that include civil engineering as a discipline have increased tremendously during the 19th and the 20th centuries, indicating the importance of this technology. However, the most prominent contributor in this field is considered to be computer-aided design CAD and computer-aided manufacture CAM. Civil engineers use this technology to achieve an efficient system of construction, including manufacture, fabrication, and erection. Three-dimensional design software is an essential tool for the civil engineer that facilitates him in the efficient designing of bridges, tall buildings, and other huge complicated structures.

ANCIENT ENGINEERS pdf

3: "Ancient Aliens" Aliens and Ancient Engineers (TV Episode) - IMDb

Ancient astronauts: The term has a ring to it, conjuring up visions of lost civilizations, extraterrestrial visitors to primitive earthly civilizations, and high intellectual adventure. No one who has read science fiction in his youth can forget those marvelous short stories that ended with the.

One of the most fascinating enigmas for archaeologists in the 21st century is how ancient mankind managed to quarry, lift, and interlock megalithic blocks of stone weighing between 10 and tons. Without the use of advanced technologies, just how did ancient cultures around the block build megalithic sites such as Puma Punku, Teotihuacan, Sacsayhuaman, Ollantaytambo, and Baalbek? Is it possible that they had in their possession now lost, advanced technology that we are unaware of? One of the most impressive ancient sites on the planet is Baalbek. Located in modern-day Lebanon, in Roman times this ancient complex was known as Heliopolis, or the city of the sun. The true age of this sacred site remains a profound mystery for scholars. Mainstream archaeologists have mixed feeling about the site and its age. Most researchers believe Baalbek was a Phoenician sanctuary dedicated to the God Baal, even though most people would agree that the site was built by the Romans. The truth, however, is that no one can accurately say how old it is. Many believe that Baalbek goes back tens of thousands of years, even possibly some 20, years, making it one of the oldest sites on the planet. The megalithic blocks of stone found at the site have caused admiration, amazement, and controversy, not only in the archaeological community but general population as well. The temple in honor of Jupiter stands on a platform that has defied explanation. The Trilithon is where all mainstream explanations are shattered. Three colossal blocks measuring 22 meters in length, nearly 5 meters in height with a width of 3. Their weight ranges between one and two thousand tons. Just how did ancient people manage to quarry, transport, lift and place these megalithic blocks of stones thousands of years ago, without the use of modern technology? The three blocks are positioned onto a row of six granite blocks, which measure 10 meters in length and 4 meters in height, their weight is estimated to be over tons. Today, modern engineers would have a hard time transporting a 50 ton block. However, ancient people seemed to have had a way to transport blocks of stone of incredible size with ease. The entire ancient complex of Baableb was constructed with HUGE megalithic blocks that range in weight from and 1, tons each. How is it possible that ancient people managed to transport this huge blocks of stone and then place them in position so that they fit perfectly with each other. Mainstream archaeology has no clue! Better yet, the precision found at Baalbek is fascinating, resembling other ancient sites in South America. The precision of the megaliths is breathtaking; they were arranged in such a way that you cannot fit a single sheet of paper in-between them. Surprisingly, in the vicinity, researchers discovered another huge block of stone partially buried with staggering dimensions: But why did ancient builders halt its construction? This is why one of the biggest questions about Baalbek remains the biggest mystery: How did the ancients do it? Heliopolis at Baalbek â€" The upper stone re-constructions were done by the Romans, but the lower ton stone bricks forming the original foundationâ€¦ nobody knows.

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4: The Ancient Engineers - Wikipedia

*The Ancient Engineers: An Astonishing Look Back at the Ancient Wonders of the World and Their Creators [L. Sprague De Camp] on www.enganchecubano.com *FREE* shipping on qualifying offers. "Mr. de Camp has the trick of being able to show technology engaging in feats as full of derring-do as those of Hannibal's army.*

They were the result of incredible advances in engineering and innovation as new, powerful civilizations emerged and came to dominate the ancient world. These advances stimulated societies to adopt new ways of living and governance, as well as new ways of understanding their world. However, many ancient inventions were forgotten, lost to the pages of history, only to be re-invented millennia later. Here we feature ten of the best examples of ancient technology and inventions that demonstrate the ingenuity of our ancient ancestors. The ancient invention of the steam engine by the Hero of Alexandria Heron Alexandrinus, otherwise known as the Hero of Alexandria, was a 1 st century Greek mathematician and engineer who is known as the first inventor of the steam engine. His steam powered device was called the aeolipile, named after Aiolos, God of the winds. The aeolipile consisted of a sphere positioned in such a way that it could rotate around its axis. Nozzles opposite each other would expel steam and both of the nozzles would generate a combined thrust resulting in torque, causing the sphere to spin around its axis. The rotation force sped up the sphere up to the point where the resistance from traction and air brought it to a stable rotation speed. The steam was created by boiling water under the sphere â€" the boiler was connected to the rotating sphere through a pair of pipes that at the same time served as pivots for the sphere. Is the Assyrian Nimrud lens the oldest telescope in the world? The Nimrud lens is a 3,year-old piece of rock crystal, which was unearthed by Sir John Layard in at the Assyrian palace of Nimrud, in modern-day Iraq. The Nimrud lens also called the Layard lens is made from natural rock crystal and is a slightly oval in shape. It was roughly ground, perhaps on a lapidary wheel. It has a focal point about 11 centimetres from the flat side, and a focal length of about 12 cm. The surface of the lens has twelve cavities that were opened during grinding, which would have contained naptha or some other fluid trapped in the raw crystal. Since its discovery over a century ago, scientists and historians have debated its use, with some suggesting it was used as a magnifying glass, and others maintaining it was a burning-glass used to start fires by concentrating sunlight. However, prominent Italian professor Giovanni Pettinato proposed the lens was used by the ancient Assyrians as part of a telescope, which would explain how the Assyrians knew so much about astronomy. According to conventional perspectives, the telescope was invented by Dutch spectacle maker, Hans Lippershey in AD, and Galileo was the first to point it to the sky and use it to study the cosmos. While lenses were around before the Nimrud lens, Pettinato believes this was one of the first to be used in a telescope. The Oldest Calendar in Scotland Research carried out last year on an ancient site excavated by the National Trust for Scotland in revealed that it contained a sophisticated calendar system that is approximately 10, years old, making it the oldest calendar ever discovered in the world. The site â€" at Warren Field, Crathes, Aberdeenshire â€" contains a 50 metre long row of twelve pits which were created by Stone Age Britons and which were in use from around BC the early Mesolithic period to around 4, BC the early Neolithic. The pits represent the months of the year as well as the lunar phases of the moon. They were formed in a complex arc design in which each lunar month was divided into three roughly ten day weeks â€" representing the waxing moon, the full moon and the waning moon. It also allowed the observation of the mid-winter sunrise so that the lunar calendar could be recalibrated each year to bring it back in line with the solar year. The entire arc represents a whole year and may also reflect the movements of the moon across the sky. Ancient Roman Concrete was Far Superior to Our Own Scientists studying the composition of Roman concrete, which has been submerged under the Mediterranean Sea for the last 2, years, discovered that it was superior to modern-day concrete in terms of durability and being less environmentally damaging. The Romans made concrete by mixing lime and volcanic rock. For underwater structures, the combination of lime and volcanic ash with seawater instantly triggered a chemical reaction in which the lime incorporated molecules into its structure and reacted with the ash to cement the whole mixture together. Analysis of the concrete found that it produces a significantly different compound to modern day cement, which is an incredibly stable

binder. In addition, the ancient concrete contains the ideal crystalline structure of Tobermorite, which has a greater strength and durability than the modern equivalent. Finally, microscopic studies identified other minerals in the ancient concrete which show potential application for high-performance concretes, including the encapsulation of hazardous wastes. Fire gilding and silvering are age-old mercury-based processes used to coat the surface items such as jewels, statues and amulets with thin layers of gold or silver. From a technological point of view, what the ancient gilders achieved years ago, was to make the metal coatings incredibly thin, adherent and uniform, which saved expensive metals and improved its durability, something which has never been achieved to the same standard today. Apparently without any knowledge about the chemicalâ€"physical processes, ancient craftsmen systematically manipulated metals to create spectacular results. They developed a variety of techniques, including using mercury like a glue to apply thin films of metals to objects. The findings demonstrate that there was a far higher level of understanding and knowledge of advanced concepts and techniques in our ancient past than what they are given credit for. The incredible year-old earthquake detector Although we still cannot accurately predict earthquakes, we have come a long way in detecting, recording, and measuring seismic shocks. The device was remarkably accurate in detecting earthquakes from afar, and did not rely on shaking or movement in the location where the device was situated. Eight dragons snaked face-down along the outside of the barrel, marking the primary compass directions. Beneath the dragons sat eight bronze toads, with their broad mouths gaping to receive the balls. The seismoscope detected all of them. As a matter of fact, the data gathered from the tests corresponded accurately with that gathered by modern-day seismometers! Mythical sunstone used as ancient navigational device An ancient Norse myth described a magical gem used to navigate the seas, which could reveal the position of the sun when hidden behind clouds or even before dawn or after sunset. Now it appears the myth is in fact true. In March , a team of scientists announced that a unique calcite crystal, which was found in the wreck of an Elizabethan ship sunk off the Channel Islands, contains properties consistent with the legendary Viking sunstone and that shards of the crystal can indeed act as a remarkably precise navigational aid. According to the researchers, the principle behind the sunstone relies on its unusual property of creating a double refraction of sunlight, even when it is obscured by cloud or fog. The Baghdad Battery The Baghdad Battery, sometimes referred to as the Parthian Battery, is a clay pot which encapsulates a copper cylinder. Suspended in the centre of this cylinderâ€"but not touching itâ€"is an iron rod. Both the copper cylinder and the iron rod are held in place with an asphalt plug. These artifacts more than one was found were discovered during the excavations of the old village Khujut Rabu, near Baghdad. The village is considered to be about years old, and was built during the Parthian period BC to AD. After the Second World War, Willard Gray, an American working at the General Electric High Voltage Laboratory in Pittsfield, built replicas and, filling them with an electrolyte, found that the devices could produce 2 volts of electricity. The question remains, if it really was a battery, what was it used to power? It baffled scientists ever since the glass chalice was acquired by the British Museum in the s. They could not work out why the cup appeared jade green when lit from the front but blood red when lit from behind. The mystery was solved in , when researchers in England scrutinized broken fragments under a microscope and discovered that the Roman artisans were nanotechnology pioneers: The work was so precise that there is no way that the resulting effect was an accident. In fact, the exact mixture of the metals suggests that the Romans had perfected the use of nanoparticles. The ancient Antikythera mechanism The Antikythera mechanism was discovered in during the recovery of a shipwreck off of the Greek island, Antikythera, in waters 60 meters deep. It is a metallic device which consists of a complex combination of gears, and dates back to the 2nd century BCE. The Antikythera mechanism is one of the most amazing mechanical devices discovered from the ancient world. For decades, scientists have utilized the latest technology in attempts to decipher its functionality; however, due to its complexity, its true purpose and function remained elusive. But in the last few years, a number of scientists appear to have solved the mystery as to precisely how this incredible piece of technology once worked. Peter Lynch, professor of meteorology at University College Dublin, explains: An extendable arm with a pin followed a spiral groove, like a record player stylus. A small sphere, half white and half black, indicated the phase of the moon. Even more impressive was the prediction of solar and lunar eclipses. Just one small cog out of 30 remains a mystery and

it is hoped that further research can place this last piece in the puzzle.

5: 'Impossible' Ancient Engineering: The Megalithic Stones of Baalbek | Ancient Code

"A lovingly compiled catalogue of engineering achievement, prepared most especially for young engineers, and dedicated to the appreciation of the works of pioneers. The reader is shown the problems and guided to their solutions, via all the technical detail needed to command attention.

Roman roads Roman roads were constructed to be immune to floods and other environmental hazards. Some roads built by the Romans are still in use today. There were several variations on a standard Roman road. Most of the higher quality roads were composed of five layers. The bottom layer, called pavimentum, was one inch thick and made of mortar. Above this were four strata of masonry. The layer directly above the pavimentum was called the statumen. It was one foot thick, and was made of stones bound together by cement or clay. Above that, there were the rudens, which were made of ten inches of rammed concrete. The next layer, the nucleus, was made of twelve to eighteen inches of successively laid and rolled layers of concrete. Summa crusta of silex or lava polygonal slabs, one to three feet in diameter and eight to twelve inches thick, were laid on top of the rudens. The final upper surface was made of concrete or well smoothed and fitted flint. Generally, when a road encountered an obstacle, the Romans preferred to engineer a solution to the obstacle rather than redirecting the road around it: Bridges were constructed over all sizes of waterway; marshy ground was handled by the construction of raised causeways with firm foundations; hills and outcroppings were frequently cut or tunneled through rather than avoided the tunnels were made with square hard rock block. Mining[edit] Drainage wheel from Rio Tinto mines. The Romans were the first to exploit mineral deposits using advanced technology, especially the use of aqueducts to bring water from great distances to help operations at the pithead. Their technology is most visible at sites in Britain such as Dolaucothi where they exploited gold deposits with at least 5 long aqueducts tapping adjacent rivers and streams. They used the water to prospect for ore by unleashing a wave of water from a tank to scour away the soil and so reveal the bedrock with any veins exposed to sight. They used the same method known as hushing to remove waste rock, and then to quench hot rocks weakened by fire-setting. Such methods could be very effective in opencast mining, but fire-setting was very dangerous when used in underground workings. They were made redundant with the introduction of explosives , although hydraulic mining is still used on alluvial tin ores. They were also used to produce a controlled supply to wash the crushed ore. It is highly likely that they also developed water-powered stamp mills to crush hard ore, which could be washed to collect the heavy gold dust. At alluvial mines, they applied their hydraulic mining methods on a vast scale, such as Las Medulas in north-west Spain. Traces of tanks and aqueducts can be found at many other early Roman mines. The methods are described in great detail by Pliny the Elder in his Naturalis Historia. He also described deep mining underground, and mentions the need to dewater the workings using reverse overshot water-wheels , and actual examples have been found in many Roman mines exposed during later mining attempts. The copper mines at Rio Tinto were one source of such artifacts, where a set of 16 was found in the s. They also used Archimedean screws to remove water in a similar way. Roman military engineering Engineering was also institutionally ingrained in the Roman military, who constructed forts, camps, bridges, roads, ramps, palisades, and siege equipment amongst others. This bridge was completed in only ten days by a dedicated team of engineers. The army was also closely involved in gold mining and probably built the extensive complex of leats and cisterns at the Roman gold mine of Dolaucothi in Wales shortly after conquest of the region in 75 AD. Arles Aqueduct Mills below aqueduct Water wheel technology was developed to a high level during the Roman period, a fact attested both by Vitruvius in De Architectura and by Pliny the Elder in Naturalis Historia. The largest complex of water wheels existed at Barbegal near Arles , where the site was fed by a channel from the main aqueduct feeding the town. It is estimated that the site comprised 16 separate overshot water wheels arranged in two parallel lines down the hillside. The outflow from one wheel became the input to the next one down in the sequence. Twelve kilometers north of Arles, at Barbegal, near Fontvieille , where the aqueduct arrived at a steep hill, the aqueduct fed a series of parallel water wheels to power a flourmill. There are two aqueducts which join just north of the mill complex, and a sluice which enabled the operators to control the water supply to the complex.

There are substantial masonry remains of the water channels and foundations of the individual mills, together with a staircase rising up the hill upon which the mills are built. The mills apparently operated from the end of the 1st century until about the end of the 3rd century. Dating to the second half of the 3rd century AD, [5] the sawmill is the earliest known machine to combine a crank with a connecting rod. A waterwheel fed by a mill race is shown powering two frame saws via a gear train cutting rectangular blocks. They attest a diversified use of water-power in many parts of the Roman Empire. The Aurelian Walls were carried up the hill apparently to include the water mills used to grind grain towards providing bread flour for the city. The mill was thus probably built at the same time as or before the walls were built by the emperor Aurelian reigned AD. The mills were supplied from an aqueduct, where it plunged down a steep hill. The mills were in use in AD when the Goths besieging the city cut off their water supply. However they were subsequently restored and may have remained in operation until at least the time of Pope Gregory IV

6: Ten amazing inventions from ancient times | Ancient Origins

Roman aqueducts used gravity, not pumps, with a slight downward inclination for the water to flow. Other innovations included the use of arcades to transport water over valleys and low-lying terrain, with the extensive use of concrete and waterproof cement linings. Another innovation was the use of.

7: ancient engineering | Ancient Origins

Ancient Origins articles related to ancient engineering in the sections of history, archaeology, human origins, unexplained, artifacts, ancient places and myths and legends.

8: Army Engineer History | Headquarters, U.S. Army Corps of Engineers

Directed by David Osper. With Robert Clotworthy, Brien Foerster, Jesus Gamarra, Andrew Collins. Might the tools and technology of ancient builders have come from distant galaxies?

9: The Ancient Engineers by L. Sprague de Camp

Watch the Aliens and Ancient Engineers full episode from Season 3, Episode 6 of HISTORY's series Ancient Aliens. Get more of your favorite full episodes only on HISTORY.

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