

Technology and innovation in the Middle East

By WGBH, adapted by Newsela staff on 01.09.18

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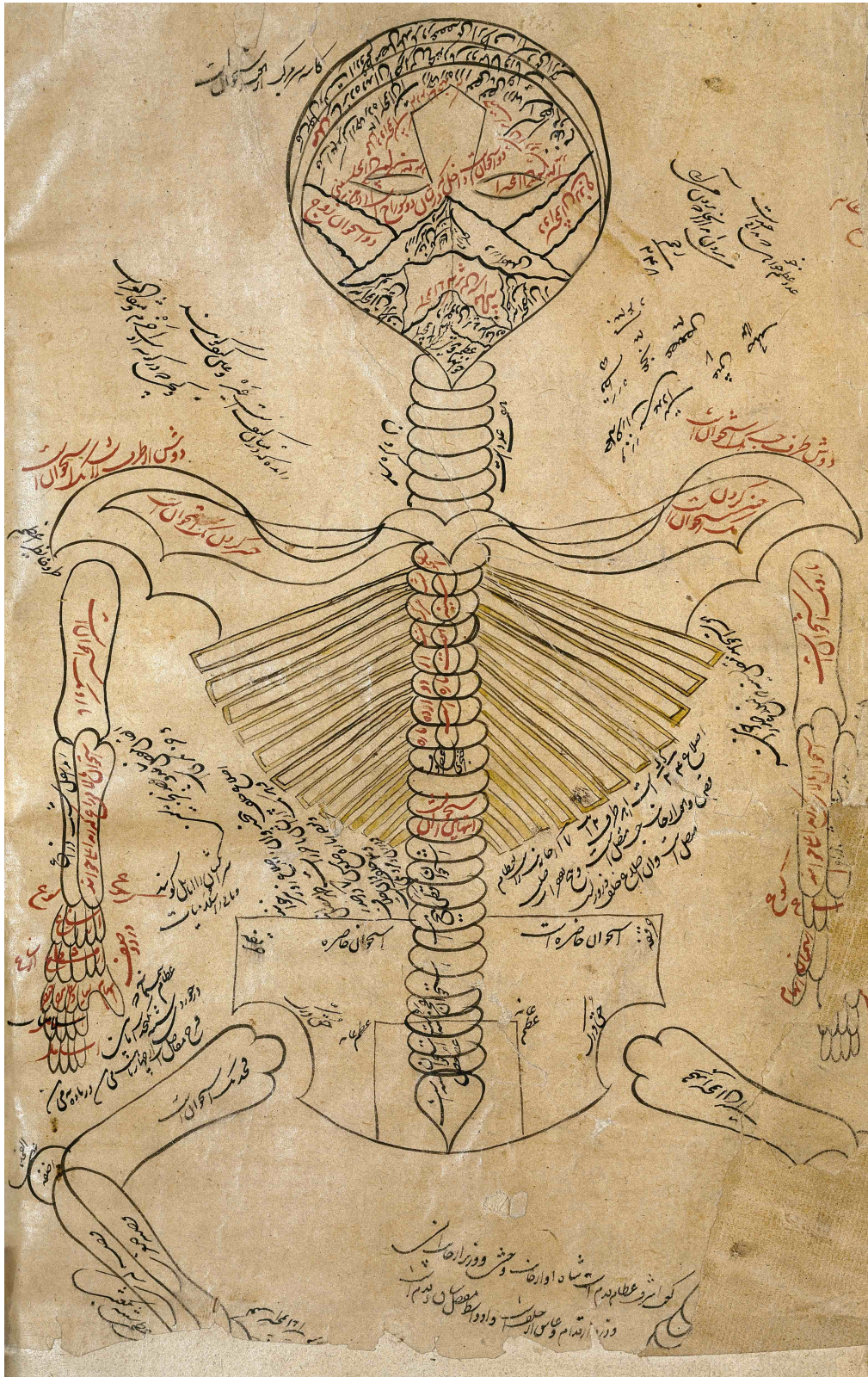
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Image 1. Constellation of Canis Major as shown on the Manuchihr Globe. The globe was made around A.D. 1632, under the orders of Manuchihr Khan, the governor of the Khorasan region in the Middle East. Photo from the Adilnor Collection/Wikimedia

The religion of Islam developed in the seventh century A.D. With it, so did the study of science and technology. Muslim rulers encouraged the translation of Greek philosophy and science texts. They also encouraged further scientific exploration in mathematics, astronomy, medicine, chemistry, physics and other scientific fields.

In mathematics, Muslim scholars introduced the use of zero, and even the Arabic word "algebra." Muslim astronomers knew the Earth was round and calculated its diameter. Ibn al-Haytham explored momentum, gravity and optics. This happened 600 years before Italian astronomer Galileo would argue that the Earth orbited the sun.



Muslim doctors performed eye surgery and treated painful kidney stones while Europeans were still using blood-sucking leeches to remove blood from their patients. The 10th-century thinker Ibn Sina, known in Europe as Avicenna, wrote "al-Qanun fi al-Tibb," or the "Canons of Medicine." This influential text contained many findings, and was the first to recognize that tuberculosis was contagious. European medicine relied on this text until well into the 1700s.

Much of the knowledge developed by Muslims allowed Europeans to move past the Dark Ages. This paved the way for the European Renaissance, which brought technological, artistic and intellectual development.

The Technological Advance Of The West

During the 16th century, the Ottoman astronomer Taqi al-Din estimated the movements and measurements of the planets, stars and moon. These were considered at least as accurate as those of 16th-century astronomer Tycho Brahe, a leading thinker in Europe. Only a century later, though, the Ottomans, along with Muslims in Mughal India and Persia, stopped supporting scientific research.

Groups that did not like change became more powerful than those favoring growth and experimentation. Meanwhile, building on the earlier accomplishments of Muslim scientists, Europe's began its scientific and industrial revolutions. These allowed Europe and North America, or the West, to develop stronger weapons and more wealth than the Islamic world.

By the 19th century, Middle Eastern states like Egypt, Iran and the Ottoman Empire decided to develop modern infrastructure, including railroads and telegraph lines. However, they had to hire foreign companies to do the work. There was a great deal of money to be made from building this infrastructure. However, the Middle Eastern governments were hurting for cash. So they sold the right to develop these projects to European companies.

These opportunities gave European governments an interest in influencing Middle Eastern governments. The Europeans, who now controlled infrastructure such as railroads, wanted to protect their investments. Thanks to its advances in technology, the West strengthened its power in the region. However, Middle Eastern countries began to resent this Western advantage. It was seen as a threat to the independence of the Islamic world.

Technological Advances And The Environment

Historically, some of the most important technological achievements in the Middle East involve the use of water. For example, the ancient Iranian qanats were underground canals that brought water from the mountains to the desert plain.



Another example was the Aswan Dam, which was built in 1898 and became the first major modern dam project. This dam regulated the water flow from the Nile River to the crops, generated vital electricity and protected Egypt from drought. Unfortunately, it also introduced environmental problems. Before the dam, when the Nile flooded, it would deposit rich silt into Egyptian fields. This material would fertilize the soil. Now, the silt is sent to Lake Nasser behind the Aswan Dam. As a result, farmers downstream are forced to use massive amounts of chemical fertilizers. These run off into, and pollute, the Nile.

The overall dryness of the region has motivated some of the richer countries to search for technological solutions to obtain and distribute water. Through careful research, they have become experts in water recycling, solar energy and desalination — removing salt from seawater. The region's oil-poor countries, however, Egypt among them, cannot afford such advanced technologies. They depend on more traditional water resources.

Access To Technology Varies

Development of technology varies widely in the Middle East today. Different areas have different requirements. Israel is a technological leader and has a close relationship with Western countries. For example, it is a world leader in the development of voice-recognition software for computers

However, some people in the Middle East still have little access to the Internet. Even so, cheap, portable technologies are transforming the Middle East. Cellular phones, for example, are increasingly popular in the Middle East. They provide telephone access to more remote, faraway communities as well as in crowded cities.



Satellite television news stations like Al-Jazeera provide varied sources of information to people in the Middle East. In the past, many only had access to government-controlled news.

Internet cafes have sprung up in major cities and in regional centers throughout the Middle East. This has given people access to information who cannot afford to buy a computer themselves. In some countries, however, the government is the only Internet provider and may censor, or block, any information on the web.

Poorer countries cannot take advantage of these new technologies. The ability to access new technology is related to both a country's wealth and how strict its government is.

Quiz

- 1 Which statement from the article would be MOST important to include in a summary of the article?
- (A) In mathematics, Muslim scholars introduced the use of zero, and even the Arabic word "algebra."
 - (B) Much of the knowledge developed by Muslims allowed Europeans to move past the Dark Ages.
 - (C) There was a great deal of money to be made from building this infrastructure.
 - (D) Cellular phones, for example, are increasingly popular in the Middle East.
- 2 Which two of the following sentences from the article include CENTRAL ideas of the article?
1. *European medicine relied on this text until well into the 1700s.*
 2. *Meanwhile, building on the earlier accomplishments of Muslim scientists, Europe began its scientific and industrial revolutions.*
 3. *Development of technology varies widely in the Middle East today.*
 4. *In some countries, however, the government is the only Internet provider and may censor, or block, any information on the web.*
- (A) 1 and 3
 - (B) 1 and 4
 - (C) 2 and 3
 - (D) 2 and 4
- 3 What is the MAIN reason the author includes the section "The Technological Advance Of The West"?
- (A) to explain why Western countries became more technologically advanced than Middle Eastern countries
 - (B) to shift the focus from Middle Eastern advancements to Western advancements
 - (C) to compare the achievements made by Middle Eastern countries with the achievements made by Western countries
 - (D) to emphasize the importance of having leaders who value change and experimentation in the Middle East

- 4 Why does the author include information about the Aswan Dam?
- (A) to suggest that this technological achievement was actually unsuccessful and hurt the Middle East
 - (B) to highlight the most important technological achievement in the Middle East in modern times
 - (C) to emphasize the last greatest achievement the Middle East has made in water technology
 - (D) to contrast an important achievement in technology with some of its unexpected consequences