Decimal System

Numbers and mathematics are some of the most important developments of humanity. Numbers are everywhere, even if you cannot see them. Through the thousands of years of civilization there have been hundreds of counting systems. Numbers are very important for administration and science, but also religion and agriculture. Farmers and priests were among the first in ancient societies to look for ways to quantify (count). Predicting the rainy seasons, counting days in a year, calculating taxes and establishing crop yields are as old as the oldest civilization.

Of all the hundreds of counting systems, there is but one that is used worldwide. The Hindu-Arabic decimal system, better known as the decimal system. Even though this system of counting is called Hindu-Arabic, the majority of its development took place in Hindustan more than 2500 years ago (500 BCE). The method in which the numbers were used has changed throughout the years. The number zero was first used in the year 867 CE in the Chaturbhuja Mandir in Gwalior, India. The Muslim mathematician al-Khwarizmi and al-Kindi wrote extensive books (respectively 825 CE and 830 CE) on the use of this counting system. The book written by al-Kindi was called "On the use of Hindu numbers". Muslim scientists introduced sophisticated mathematical concepts into the decimal system, like fractions, triangulation, algebra, and geometry. This contribution was justly known as Islamic Mathematics.

The simple counting system of Hindustan was improved upon to handle complex problems. Latin, Babylonian and Persian counting systems required great effort to solve the same problems. In the 13th century the decimal system was the most widely used counting system in the Islamic World. This was later copied by Europeans to replace their primitive roman numeral system. Mathematics was a required course to obtain a title as an Islamic Judge (Qadi). Jurist, doctors, astronomers and even imams were required to master mathematics to obtain their title (Jizia).
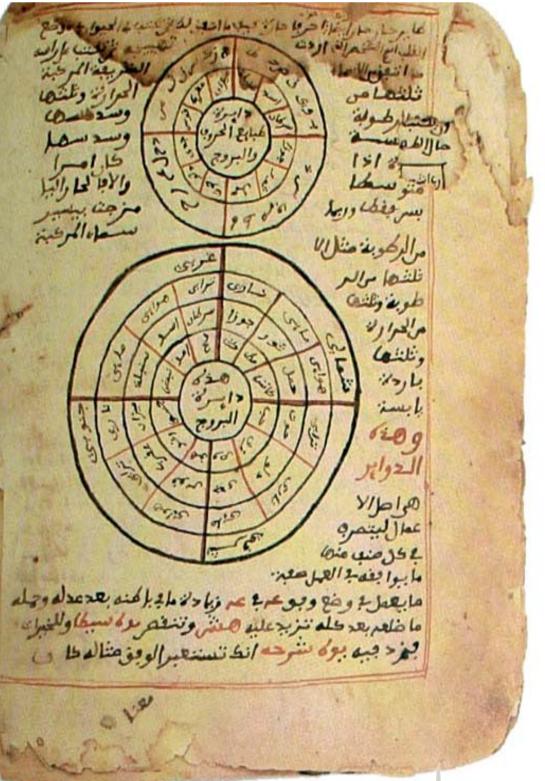
Crypto analyses

Secret codes have existed since the beginning of language. The moment people had something they wanted to write down they had secrets they wanted to hide in their message or the entire message itself. Al-Kindi (801-873 CE), a polymath (universal scientist) was also a very learned mathematician. He was the first crypto analyst. Somebody that deciphers hidden messages in texts or numbers using mathematical algorithms (formulas). An important tool to keep great empires together was through keeping secrets. Many rulers in the Islamic world (and eastern world) had scholars and mathematicians in their courts. These would convert important messages and administration in code language. These were particular to troop movements, valuable transport, caravan routes and debts.

Even political intrigue and personal correspondence were sometimes written in code language. Al-Kindi made crypto analyses a science and is mostly known for his mathematics, physics and chemistry. Surprisingly the majority of his work was about Islam, music, ethics and philosophy.

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Hindu		०	१	२	३	४	५	६	७	८	९
Arabic		٠	١	٢	٣	٤	٥	٦	٧	٨	٩
Medieval		O	I	2	3	८	५	6	٨	8	9
Modern		0	1	2	3	4	5	6	7	8	9

Hindu-Arabic numbers comparison.

Astronomy and Mathematics manuscript.
Timbuktu, Mali. West-Afrika.

Discription of a compass and its uses. 13th century, Turkey.

Kitāb al-Qāḍī fī al-birkār al-tāmm, MS Istanbul, Raghib Pasha 569, fol. 235ᵛ.

Mathamatical manusctipt on circular geometry.
Al-Tusi, 13th century CE.