

Islamic Studies

Syllabus 9488

3.1 The Heritage of The Umayyads

Cambridge Resources:

www.khanacademy.org/humanities/world-history/medieval-times/spread-of-islam/a/the-rise-of-islamic-empires-and-states

<https://courses.lumenlearning.com/boundless-worldhistory/chapter/the-umayyad-and-abbasid-empires/>

<https://ohfact.com/interesting-facts-about-ummayad-caliphate/>

<http://islamichistory.org/the-umayyads/>

www.britannica.com/topic/Umayyad-dynasty-Islamic-history

<https://courses.lumenlearning.com/boundless-worldhistory/chapter/pre-islamic-arabia/>

<https://en.qantara.de/content/pre-islamic-art-saudi-arabia>

www.al-islam.org/restatement-history-islam-and-muslims-sayyid-ali-ashgar-razwy/arabia-islam

www.metmuseum.org/toah/hd/umay/hd_umay.htm

www.academia.edu/11332920/The_Greatest_Achievement_of_Ummayad_Caliphate

www.history-science-technology.com/articles/articles%2012.html

<http://factsanddetails.com/world/cat55/3sub2/entry-5226.html>

www.jstor.org/stable/pdf/3087601.pdf

<http://islamic-arts.org/category/period/umayyads/>

www.ancient.eu/Minaret/

www.muslimheritage.com/article/minaret-symbol-civilization

<https://whc.unesco.org/en/list/20/gallery/>

<http://islamic-arts.org/2011/the-umayyad-mosque-of-damascus/>

www.youtube.com/watch?v=hXL2pXf-5wo

www.youtube.com/watch?v=75e4YNq4V_4

www.history.ubc.ca/faculty/lshin/teaching/150/readings/battuta.htm

<http://ibnjubayr.neatline-uva.org/neatline/fullscreen/ibn-jubayrs-journey-through-damascus/#records/328>

www.khanacademy.org/humanities/ap-art-history/early-europe-and-colonial-americas/ap-art-islamic-world-medieval/a/the-great-mosque-of-cordoba

<https://en.wikiarquitectura.com/building/mosque-of-cordoba/>

www.islamicity.org/8651/the-significance-of-the-rock-sakhrah-inside-the-al-aqsa-mosque/

www.slideshare.net/islamicjerusalem/the-architectural-development-of-alaqsa-mosque-in-the-early-islamic-period-sacred-architecture-in-the-shape-of-the-holy-65927264

www.bbc.co.uk/religion/religions/islam/history/spain_1.shtml

www.alhewar.com/habeeb_salloum_islamic_tolerance_in_al-andalus.htm

https://digitalcommons.law.yale.edu/cgi/viewcontent.cgi?referer=https://www.google.co.uk/&httpsredir=1&article=1000&context=ylsop_papers

The rise of Islamic empires and states

Over a period of a few hundred years, Islam spread from its place of origin in the Arabian Peninsula all the way to modern Spain in the west and northern India in the east.

To begin to understand the rich history of Islam, let's start with the historical context and events that led to Islam's spread. For example, Islam initially spread through the military conquests of Arab Muslims, which happened over a very short period of time soon after the beginning of Islam. However, only a small fraction of the people who came under Arab Muslim control immediately adopted Islam. It wasn't until centuries later, at the end of the eleventh century, that Muslims made up the majority of subjects of the Islamic empires.

The spread of Islam through merchants, missionaries, and pilgrims was very different in nature. These kinds of exchanges affected native populations slowly and led to more conversion to Islam. As Islamic ideas traveled along various trade and pilgrimage routes, they mingled with local cultures and transformed into new versions and interpretations of the religion.

Another important thing to note is that not all military expansion was Arab and Muslim. Early on in Islamic history, under the Rashidun caliphate—the reign of the first four caliphs, or successors, from 632 to 661 CE—and the Umayyad caliphate, Arab Muslim forces expanded quickly. With the Abbasids, more non-Arabs and non-Muslims were involved in the government administration. Later on, as the Abbasid caliphate declined, there were many fragmented political entities, some of which were led by non-Arab Muslims. These entities continued to evolve in their own ways, adopting and putting forth different interpretations of Islam as they sought to consolidate their power in different regions.

During the seventh century, after subduing rebellions in the Arabian peninsula, Arab Muslim armies began to swiftly conquer territory in the neighboring Byzantine and Sasanian empires and beyond. Within roughly two decades, they created a massive Arab Muslim empire spanning three continents. The Arab Muslim rulers were not purely motivated by religion, nor was their success attributed to the power of Islam alone, though religion certainly played a part.

Non-Muslim subjects under Arab Muslim rule were not especially opposed to their new rulers. A long period of instability and dissatisfaction had left them ambivalent toward their previous rulers. Like all other empires, the first Arab Muslim empires were built within the context of the political realities of their neighboring societies.

During the Rashidun caliphates, Arab Muslim forces expanded outward beyond the Arabian peninsula and into the territories of the neighboring Byzantine and Sasanian Empires. These empires were significantly weakened after a period of fighting with one another and other peripheral factions like the Turks, economic turmoil, disease, and environmental problems. The Arab Muslim conquerors were primed to take advantage of this; they were familiar with Byzantine and Sasanian military tactics, having served in both armies.

With the Byzantine and Sasanian Empires on the decline and strategically disadvantaged, Arab Muslim armies were able to quickly take over vast territories that once belonged to the Byzantines and Sasanians and even conquer beyond those territories to the east and west.

Most conquests happened during the reign of the second caliph, Umar, who held power from 634 to 644. The Rashidun caliphate constructed a massive empire out of many swift military victories. They expanded for both religious and political reasons, which was common at the time.

One political advantage the Rashidun caliphate held was their ability to maintain stability and unity among the Arab tribes. Distinct, feuding Arab tribes united into a cohesive political force, partially through the promise of military conquest. However, this unity was tentative and ultimately gave way to major divergences that disrupted state and religious institutions in the coming centuries.

A new political structure

The Rashidun can be credited for military expansion, but did Islam truly spread through their conquests? Significant conversion and cultural exchange did not occur during their short rule, nor were complex political institutions developed. It was not until the Umayyad Dynasty—from 661 to 750—that Islamic and Arabic culture began to truly spread. The Abbasid Dynasty—from 750 to 1258—intensified and solidified these cultural changes.

Before the Umayyads, Islamic rule was non-centralized. The military was organized under the caliphate, a political structure led by a Muslim steward known as a caliph, who was regarded as the religious and political successor to the prophet Muhammad. The early caliphate had a strong army and built garrison towns, but it did not build sophisticated administrations. The caliphate mostly kept existing governments and cultures intact and administered through governors and financial officers in order to collect taxes.

The Rashidun caliphate was also not dynastic, meaning that political leadership was not transferred through hereditary lineage.¹¹ During this period, it seems the Arab tribes retained their communal clan-based systems of choosing leaders.

However, to sustain such a massive empire, more robust state structures were necessary, and the Umayyads began developing these structures, which were often influenced by the political structures in neighboring empires like the Byzantines and Sasanians. Under the Umayyads, a dynastic and centralized Islamic political state emerged.

The Umayyads shifted the capital from Mecca to Syria and replaced tribal traditions with an imperial government controlled by a monarch. They replaced Greek, Persian, and Coptic with Arabic as the main administrative language and reinforced an Arab Islamic identity. Notably, an Arab hierarchy emerged, in which non-Arabs were accorded secondary status. The Umayyads also minted Islamic coins and developed a more sophisticated bureaucracy, in which governors named viziers oversaw smaller political units.

The Umayyads did not actively encourage conversion, and most subjects remained non-Muslim. Because non-Muslim subjects were required to pay a special tax, the Umayyads were able to subsidize their political expansion.

The Umayyads did not come into power smoothly. The transition between the rule of the Rashidun and the first Umayyads was full of strife. Debates raged about the nature of Islamic leadership and religious authority. These conflicts evolved into major schisms between Sunni, Shia, and Ibadi Islam.

Ultimately, there were many factions that regarded the Umayyads as corrupt and illegitimate, some of whom rallied around new leaders. These new leaders claimed legitimacy through shared lineage with the prophet Muhammad, through the prophet's uncle, Abbas. They led a revolt against the Umayyads, bringing the Abbasid caliphate to power.

The Abbasids were intent on differentiating themselves from their Umayyad predecessors, though they still had a lot in common. Abbasid leadership was also dynastic and centralized. However, they changed the social hierarchy by constructing a more inclusive government in a more cosmopolitan capital city, Baghdad. The distinction between Arab Muslims and non-Arab Muslims diminished, with Persian culture exerting a greater influence on the Abbasid court.

Under the Abbasids, Islamic art and culture flourished. They are famous for inaugurating the Islamic golden age. Religious scholars, called ulema, developed more defined religious institutions and took on judicial duties and developed systems of law. It was also during Abbasid rule that many people converted to Islam, for a multitude of reasons including sincere belief and avoiding paying taxes levied on non-Muslims. As a result, Islamic culture spread over the Abbasids' vast territory.

The Umayyad and Abbasid Empires

Umayyad Caliphate (661–750)

The Umayyad Caliphate was the second of the four major Arab caliphates established after the death of Muhammad. This caliphate was centered on the Umayyad dynasty, hailing from Mecca. The Umayyad family had first come to power under the third caliph, Uthman ibn Affan (r. 644–656), but the Umayyad regime was founded by Muawiya ibn Abi Sufyan, long-time governor of Syria, after the end of the First Muslim Civil War in 661 CE. Syria remained the Umayyads' main power base thereafter, and Damascus was their capital.

Under the Umayyads, the caliphate territory grew rapidly. The Islamic Caliphate became one of the largest unitary states in history, and one of the few states to ever extend direct rule over three continents (Africa, Europe, and Asia). The Umayyads incorporated the Caucasus, Transoxiana, Sindh, the Maghreb, and the Iberian Peninsula (Al-Andalus) into the Muslim world. At its greatest extent, the Umayyad Caliphate covered 5.79 million square miles and included 62 million people (29% of the world's population), making it the fifth largest empire in history in both area and proportion of the world's population. Although the Umayyad Caliphate did not rule all of the Sahara, nomadic Berber tribes paid homage to the caliph. However, although these vast areas may have recognized the supremacy of the caliph, de facto power was in the hands of local sultans and emirs.

The Umayyad dynasty was not universally supported within the Muslim community for a variety of reasons, including their hereditary election and suggestions of impious behavior. Some Muslims felt that only members of Muhammad's Banu Hashim clan or those of his own lineage, such as the descendants of Ali, should rule. Some Muslims thought that Umayyad taxation and administrative

practices were unjust. While the non-Muslim population had autonomy, their judicial matters were dealt with in accordance with their own laws and by their own religious heads or their appointees. Non-Muslims paid a poll tax for policing to the central state. Muhammad had stated explicitly during his lifetime that each religious minority should be allowed to practice its own religion and govern itself, and the policy had on the whole continued.

There were numerous rebellions against the Umayyads, as well as splits within the Umayyad ranks, which notably included the rivalry between Yaman and Qays. Allegedly, The Sunnis killed Ali's son Hussein and his family at the Battle of Karbala in 680, solidifying the Shi'a-Sunni split. Eventually, supporters of the Banu Hashim and the supporters of the lineage of Ali united to bring down the Umayyads in 750. However, the Shi'at 'Alī, "the Party of Ali," were again disappointed when the Abbasid dynasty took power, as the Abbasids were descended from Muhammad's uncle `Abbas ibn `Abd al-Muttalib, and not from Ali.

The Abbasid victors desecrated the tombs of the Umayyads in Syria, sparing only that of Umar II, and most of the remaining members of the Umayyad family were tracked down and killed. When Abbasids declared amnesty for members of the Umayyad family, eighty gathered to receive pardons, and all were massacred. One grandson of Hisham, Abd al-Rahman I, survived and established a kingdom in Al-Andalus (Moorish Iberia), proclaiming his family to be the Umayyad Caliphate revived.

Umayyad Dynasty in Cordoba, Spain

The revival of the Umayyad Caliphate in Al-Andalus (what would become modern Spain) was called the Caliphate of Córdoba, which lasted until 1031. The period was characterized by an expansion of trade and culture, and saw the construction of masterpieces of al-Andalus architecture.

The caliphate enjoyed increased prosperity during the 10th century. Abd-ar-Rahman III united al-Andalus and brought the Christian kingdoms of the north under control through force and diplomacy. Abd-ar-Rahman stopped the Fatimid advance into caliphate land in Morocco and al-Andalus. This period of prosperity was marked by increasing diplomatic relations with Berber tribes in north Africa, Christian kings from the north, and France, Germany, and Constantinople.

Córdoba was the cultural and intellectual center of al-Andalus. Mosques, such as the Great Mosque, were the focus of many caliphs' attention. The caliph's palace, Medina Azahara, was on the outskirts of the city, and had many rooms filled with riches from the East. The library of Al-Hakam II was one of the largest libraries in the world, housing at least 400,000 volumes, and Córdoba possessed translations of ancient Greek texts into Arabic, Latin and Hebrew. During the Umayyad Caliphate period, relations between Jews and Arabs were cordial; Jewish stonemasons helped build the columns of the Great Mosque. Al-Andalus was subject to eastern cultural influences as well. The musician Ziryab is credited with bringing hair and clothing styles, toothpaste, and deodorant from Baghdad to the Iberian peninsula. Advances in science, history, geography, philosophy, and language occurred during the Umayyad Caliphate as well.

Legacy of the Umayyad Caliphate

The Umayyad caliphate was marked both by territorial expansion and by the administrative and cultural problems that such expansion created. Despite some notable exceptions, the Umayyads tended to favor the rights of the old Arab families, and in particular their own, over those of newly converted Muslims (mawali). Therefore, they held to a less universalist conception of Islam than did many of their rivals.

During the period of the Umayyads, Arabic became the administrative language, in which state documents and currency were issued. Mass conversions brought a large influx of Muslims to the caliphate. The Umayyads also constructed famous buildings such as the Dome of the Rock at Jerusalem and the Umayyad Mosque at Damascus.

According to one common view, the Umayyads transformed the caliphate from a religious institution (during the Rashidun) to a dynastic one. However, the Umayyad caliphs do seem to have understood themselves as the representatives of God on Earth.

The Umayyads have met with a largely negative reception from later Islamic historians, who have accused them of promoting a kingship (*mulk*, a term with connotations of tyranny) instead of a true caliphate (*khilafa*). In this respect it is notable that the Umayyad caliphs referred to themselves not as *khalifat rasul Allah* ("successor of the messenger of God," the title preferred by the tradition), but rather as *khalifat Allah* ("deputy of God").

Many Muslims criticized the Umayyads for having too many non-Muslim, former Roman administrators in their government. St. John of Damascus was also a high administrator in the Umayyad administration. As the Muslims took over cities, they left the people's political representatives and the Roman tax collectors and administrators. The people's political representatives calculated and negotiated taxes. The central government and the local governments got paid respectively for the services they provided. Many Christian cities used some of the taxes to maintain their churches and run their own organizations. Later, the Umayyads were criticized by some Muslims for not reducing the taxes of the people who converted to Islam.

Spread of Islam

In the years following the Prophet Muhammad's death, the expansion of Islam was carried out by his successor caliphates, who increased the territory of the Islamic state and sought converts from both polytheistic and monotheistic religions.

Overview

The expansion of the Arab Empire in the years following the Prophet Muhammad's death led to the creation of caliphates occupying a vast geographical area. Conversion to Islam was boosted by missionary activities, particularly those of Imams, who easily intermingled with local populace to propagate religious teachings. These early caliphates, coupled with Muslim economics and trading and the later expansion of the Ottoman Empire, resulted in Islam's spread outwards from Mecca towards both the Atlantic and Pacific oceans and the creation of the Muslim world. Trading played an important role in the spread of Islam in several parts of the world, notably southeast Asia.

Muslim dynasties were soon established and subsequent empires such as those of the Abbasids, Fatimids, Almoravids, Seljukids, and Ajurans, Adal and Warsangali in Somalia, Mughals in India, Safavids in Persia, and Ottomans in Anatolia were among the largest and most powerful in the world. The people of the Islamic world created numerous sophisticated centers of culture and science with far-reaching mercantile networks, travelers, scientists, hunters, mathematicians, doctors, and philosophers, all contributing to the Golden Age of Islam. Islamic expansion in South and East Asia fostered cosmopolitan and eclectic Muslim cultures in the Indian subcontinent, Malaysia, Indonesia, and China.

Within the first century of the establishment of Islam upon the Arabian Peninsula and the subsequent rapid expansion of the Arab Empire during the Muslim conquests, one of the most significant empires in world history was formed. For the subjects of this new empire, formerly subjects of the greatly reduced Byzantine and obliterated Sassanid empires, not much changed in practice. The objective of

the conquests was of a practical nature more than anything else, as fertile land and water were scarce in the Arabian Peninsula. A real Islamization therefore only came about in the subsequent centuries.

Conversions to Islam

Historians distinguish between two separate strands of converts of the time. One is animists and polytheists of tribal societies of the Arabian Peninsula and the Fertile crescent; the other is the monotheistic populations of the Middle Eastern agrarian and urbanized societies.

For the polytheistic and pagan societies, apart from the religious and spiritual reasons each individual may have had, conversion to Islam “represented the response of a tribal, pastoral population to the need for a larger framework for political and economic integration, a more stable state, and a more imaginative and encompassing moral vision to cope with the problems of a tumultuous society.” In contrast, for sedentary and often already monotheistic societies, “Islam was substituted for a Byzantine or Sassanian political identity and for a Christian, Jewish or Zoroastrian religious affiliation.” Initially, conversion was neither required nor necessarily wished for: “[The Arab conquerors] did not require the conversion as much as the subordination of non-Muslim peoples. At the outset, they were hostile to conversions because new Muslims diluted the economic and status advantages of the Arabs.”

Only in subsequent centuries, with the development of the religious doctrine of Islam and with that the understanding of the Muslim Ummah, did mass conversion take place. The new understanding by the religious and political leadership led in many cases to a weakening or breakdown of the social and religious structures of parallel religious communities such as Christians and Jews. With the weakening of many churches, for example, and with the favoring of Islam and the migration of substantial Muslim Turkish populations into the areas of Anatolia and the Balkans, the “social and cultural relevance of Islam” were enhanced and a large number of peoples were converted.

During the Abbasid Caliphate, expansion ceased and the central disciplines of Islamic philosophy, theology, law, and mysticism became more widespread, and the gradual conversions of the populations within the empire occurred. Significant conversions also occurred beyond the extents of the empire, such as that of the Turkic tribes in Central Asia and peoples living in regions south of the Sahara in Africa through contact with Muslim traders active in the area and Sufi orders. In Africa it spread along three routes—across the Sahara via trading towns such as Timbuktu, up the Nile Valley through the Sudan up to Uganda, and across the Red Sea and down East Africa through settlements such as Mombasa and Zanzibar. These initial conversions were of a flexible nature.

The Arab-Muslim conquests followed a general pattern of nomadic conquests of settled regions, whereby conquering peoples became the new military elite and reached a compromise with the old elites by allowing them to retain local political, religious, and financial authority. Peasants, workers, and merchants paid taxes, while members of the old and new elites collected them.

Policy Toward Non-Muslims

The Arab conquerors did not repeat the mistake made by the Byzantine and Sasanian empires, who had tried and failed to impose an official religion on subject populations, which had caused resentments that made the Muslim conquests more acceptable to them. Instead, the rulers of the new empire generally respected the traditional middle-Eastern pattern of religious pluralism, which was not one of equality but rather of dominance by one group over the others. After the end of military operations, which involved the sacking of some monasteries and confiscation of Zoroastrian fire temples in Syria and Iraq, the early caliphate was characterized by religious tolerance, and people of all ethnicities and religions blended in public life. Before Muslims were ready to build mosques in

Syria, they accepted Christian churches as holy places and shared them with local Christians. In Iraq and Egypt, Muslim authorities cooperated with Christian religious leaders. Numerous churches were repaired and new ones built during the Umayyad era.

Some non-Muslim populations did experience persecution, however. After the Muslim conquest of Persia, Zoroastrians were given dhimmi (non-Muslim) status and subjected to persecutions; discrimination and harassment began in the form of sparse violence. Zoroastrians were made to pay an extra tax called Jizya; if they failed, they were killed, enslaved, or imprisoned. Those paying Jizya were subjected to insults and humiliation by the tax collectors. Zoroastrians who were captured as slaves in wars were given their freedom if they converted to Islam.

The Islamic Golden Age

Abbasid leadership cultivated intellectual, cultural, and scientific developments in the Islamic Golden Age.

Overview

The Islamic Golden Age refers to a period in the history of Islam, traditionally dated from the 8th century to the 13th century, during which much of the historically Islamic world was ruled by various caliphates and science, economic development, and cultural works flourished. This period is traditionally understood to have begun during the reign of the Abbasid caliph Harun al-Rashid (786–809) with the inauguration of the House of Wisdom in Baghdad, where scholars from various parts of the world with different cultural backgrounds were mandated to gather and translate all of the world's classical knowledge into the Arabic language.

The end of the age is variously given as 1258 with the Mongolian Sack of Baghdad, or 1492 with the completion of the Christian Reconquista of the Emirate of Granada in Al-Andalus, Iberian Peninsula. During the Golden Age, the major Islamic capital cities of Baghdad, Cairo, and Córdoba became the main intellectual centers for science, philosophy, medicine, and education. The government heavily patronized scholars, and the best scholars and notable translators, such as Hunayn ibn Ishaq, had salaries estimated to be the equivalent of those of professional athletes today.

The School of Nisibis and later the School of Edessa became centers of learning and transmission of classical wisdom. The House of Wisdom was a library, translation institute, and academy, and the Library of Alexandria and the Imperial Library of Constantinople housed new works of literature. Nestorian Christians played an important role in the formation of Arab culture, with the Jundishapur hospital and medical academy prominent in the late Sassanid, Umayyad, and early Abbasid periods. Notably, eight generations of the Nestorian Bukhtishu family served as private doctors to caliphs and sultans between the 8th and 11th centuries.

Literature and Philosophy

With the introduction of paper, information was democratized and it became possible to make a living from simply writing and selling books. The use of paper spread from China into Muslim regions in the 8th century, and then to Spain (and then the rest of Europe) in the 10th century. Paper was easier to manufacture than parchment and less likely to crack than papyrus, and could absorb ink, making it difficult to erase and ideal for keeping records. Islamic paper makers devised assembly-line methods of hand-copying manuscripts to turn out editions far larger than any available in Europe for centuries. The best known fiction from the Islamic world is *The Book of One Thousand and One Nights*, which took form in the 10th century and reached its final form by the 14th century, although the number and type of tales vary.

Christians (particularly Nestorian Christians) contributed to the Arab Islamic civilization during the Ummayyad and the Abbasid periods by translating works of Greek philosophers to Syriac and then to Arabic. During the 4th through the 7th centuries, scholarly work in the Syriac and Greek languages was either newly initiated or carried on from the Hellenistic period. Many classic works of antiquity might have been lost if Arab scholars had not translated them into Arabic and Persian and later into Turkish, Hebrew, and Latin. Islamic scholars also absorbed ideas from China and India, and in turn Arabic philosophic literature contributed to the development of modern European philosophy.

Ibn Rushd

Ibn Rushd, also known by his Latinized name Averroës (April 14, 1126–December 10, 1198), was an Al-Andalus Muslim polymath, a master of Aristotelian philosophy, Islamic philosophy, Islamic theology, Maliki law and jurisprudence, logic, psychology, politics, Andalusian classical music theory, medicine, astronomy, geography, mathematics, physics, and celestial mechanics. Averroes was born in Córdoba, Al-Andalus, present-day Spain, and died in Marrakesh, present-day Morocco.

The 13th-century philosophical movement based on Averroes' work is called Averroism. Both Ibn Rushd and the scholar Ibn Sina played a major role in saving the works of Aristotle, whose ideas came to dominate the non-religious thought of the Christian and Muslim worlds. Ibn Rushd has been described as the “founding father of secular thought in Western Europe.” He tried to reconcile Aristotle's system of thought with Islam. According to him, there is no conflict between religion and philosophy; rather they are different ways of reaching the same truth. He believed in the eternity of the universe. Ibn Ruhd also held that the soul is divided into two parts, one individual and one divine; while the individual soul is not eternal, all humans at the basic level share one and the same divine soul.

Science and Mathematics

The Arabs assimilated the scientific knowledge of the civilizations they had conquered, including the ancient Greek, Roman, Persian, Chinese, Indian, Egyptian, and Phoenician civilizations. Scientists recovered the Alexandrian mathematical, geometric, and astronomical knowledge, such as that of Euclid and Claudius Ptolemy.

Persian scientist Muhammad ibn Mūsā al-Khwārizmī significantly developed algebra in his landmark text, *Kitab al-Jabr wa-l-Muqabala*, from which the term “algebra” is derived. The term “algorithm” is derived from the name of the scholar al-Khwarizmi, who was also responsible for introducing the Arabic numerals and Hindu-Arabic numeral system beyond the Indian subcontinent. In calculus, the scholar Alhazen discovered the sum formula for the fourth power, using a method readily generalizable to determine the sum for any integral power. He used this to find the volume of a paraboloid.

Medicine

Medicine was a central part of medieval Islamic culture. Responding to circumstances of time and place, Islamic physicians and scholars developed a large and complex medical literature exploring and synthesizing the theory and practice of medicine. Islamic medicine was built on tradition, chiefly the theoretical and practical knowledge developed in India, Greece, Persia, and Rome. Islamic scholars translated their writings from Syriac, Greek, and Sanskrit into Arabic and then produced new medical knowledge based on those texts. In order to make the Greek tradition more accessible, understandable, and teachable, Islamic scholars organized the Greco-Roman medical knowledge into encyclopedias.

Art

Ceramics, glass, metalwork, textiles, illuminated manuscripts, and woodwork flourished during the Islamic Golden Age. Manuscript illumination became an important and greatly respected art, and portrait miniature painting flourished in Persia. Calligraphy, an essential aspect of written Arabic, developed in manuscripts and architectural decoration.

Arabesque

Typically, though not entirely, Islamic art depicts nature patterns and Arabic calligraphy, rather than figures, because many Muslims feared that the depiction of the human form is idolatry and thereby a sin against God, forbidden in the Quran. There are repeating elements in Islamic art, such as the use of geometrical floral or vegetal designs in a repetition known as the arabesque. The arabesque in Islamic art is often used to symbolize the transcendent, indivisible, and infinite nature of God. Mistakes in repetitions may be intentionally introduced as a show of humility by artists who believe only God can produce perfection, although this theory is disputed.

Calligraphy

The traditional instrument of the Arabic calligrapher is the qalam, a pen made of dried reed or bamboo. Qalam ink is often in color, and chosen such that its intensity can vary greatly, so that the greater strokes of the compositions can be very dynamic in their effect. Islamic calligraphy is applied on a wide range of decorative mediums other than paper, such as tiles, vessels, carpets, and inscriptions. Before the advent of paper, papyrus and parchment were used for writing.

Coins were another support for calligraphy. Beginning in 692, the Islamic caliphate reformed the coinage of the Near East by replacing visual depiction with words. This was especially true for dinars, or gold coins of high value, which were inscribed with quotes from the Quran.

By the 10th century, the Persians, who had converted to Islam, began weaving inscriptions on elaborately patterned silks. These calligraphic-inscribed textiles were so precious that Crusaders brought them to Europe as prized possessions. A notable example is the *Suaire de Saint-Josse*, used to wrap the bones of St. Josse in the abbey of St. Josse-sur-Mer near Caen in northwestern France.

Architecture and Tilework

There were many advances in architectural construction, and mosques, tombs, palaces, and forts were inspired by Persian and Byzantine architecture. Islamic mosaic art anticipated principles of quasicrystalline geometry, which would not be discovered for 500 more years. This art used symmetric polygonal shapes to create patterns that can continue indefinitely without repeating. These patterns have even helped modern scientists understand quasicrystals at the atomic levels.

The Umayyad Caliphate

The Umayyads were the first Muslim dynasty — that is, they were the first rulers of the Islamic Empire to pass down power within their family.

According to tradition, the Umayyad family (also known as the Banu Abd-Shams) and Muhammad [saw] both descended from a common ancestor, Abd Manaf ibn Qusai, and they originally came from the city of Mecca. Muhammad [saw] descended from Abd Manāf via his son Hashim, while the Umayyads descended from Abd Manaf via a different son, Abd-Shams, whose son was Umayya. The two families are therefore considered to be different clans (those of Hashim and of Umayya, respectively) of the same tribe (that of the Quraish).

The shift in power to Damascus, the Umayyad capital city, was to have profound effects on the development of Islamic history. For one thing, it was a tacit recognition of the end of an era. The first four caliphs had been without exception Companions of the Prophet – pious, sincere men who had lived no differently from their neighbors and who preserved the simple habits of their ancestors despite the massive influx of wealth from the conquered territories. Even ‘Uthman, whose policies had such a divisive effect, was essentially dedicated more to the concerns of the next world than of this. With the shift to Damascus much was changed.

In the early days of Islam, the extension of Islamic rule had been based on an uncomplicated desire to spread the Word of God. Although the Muslims used force when they met resistance they did not compel their enemies to accept Islam. On the contrary, the Muslims permitted Christians and Jews to practice their own faith and numerous conversions to Islam were the result of exposure to a faith that was simple and inspiring.

With the advent of the Umayyads, however, secular concerns and the problems inherent in the administration of what, by then, was a large empire began to dominate the attention of the caliphs, often at the expense of religious concerns – a development that disturbed many devout Muslims. This is not to say that religious values were ignored; on the contrary, they grew in strength for centuries. But they were not always at the forefront and from the time of Mu’awiyah the caliph’s role as “Defender of the Faith” increasingly required him to devote attention to the purely secular concerns which dominate so much of every nation’s history.

Mu’awiyah was an able administrator, and even his critics concede that he possessed to a high degree the much-valued quality of *hilm* – a quality which may be defined as “civilized restraint” and which he himself once described in these words:

I apply not my sword where my lash suffices, nor my lash where my tongue is enough. And even if there be one hair binding me to my fellowmen, I do not let it break: when they pull I loosen, and if they loosen I pull.

Nevertheless, Mu’awiyah was never able to reconcile the opposition to his rule nor solve the conflict with the Shi’is. These problems were not unmanageable while Mu’awiyah was alive, but after he died in 680 the partisans of ‘Ali resumed a complicated but persistent struggle that plagued the Umayyads at home for most of the next seventy years and in time spread into North Africa and Spain.

The Umayyads, however, did manage to achieve a degree of stability, particularly after ‘Abd al-Malik ibn Marwan succeeded to the caliphate in 685. Like the Umayyads who preceded him, ‘Abd al-Malik was forced to devote a substantial part of his reign to political problems. But he also introduced much needed reforms. He directed the cleaning and reopening of the canals that irrigated the Tigris-Euphrates Valley – a key to the prosperity of Mesopotamia since the time of the Sumerians – introduced the use of the Indian water buffalo in the riverine marshes, and minted a standard coinage which replaced the Byzantine and Sassanid coins, until then the sole currencies in circulation. ‘Abd al-Malik’s organization of government agencies was also important; it established a model for the later elaborate bureaucracies of the ‘Abbasids and their successor states. There were specific agencies charged with keeping pay records; others concerned themselves with the collection of taxes. ‘Abd al-Malik established a system of postal routes to expedite his communications throughout the far flung empire. Most important of all, he introduced Arabic as the language of administration, replacing Greek and Pahlavi.

Under ‘Abd al-Malik, the Umayyads expanded Islamic power still further. To the east they extended their influence into Transoxania, an area north of the Oxus River in today’s Soviet Union, and went on to reach the borders of China. To the west, they took North Africa, in a continuation of the

campaign led by ‘Uqbah ibn Nafi’ who founded the city of Kairouan – in what is now Tunisia – and from there rode all the way to the shores of the Atlantic Ocean.

These territorial acquisitions brought the Arabs into contact with previously unknown ethnic groups who embraced Islam and would later influence the course of Islamic history. The Berbers of North Africa, for example, who resisted Arab rule but willingly embraced Islam, later joined Musa ibn Nusayr and his general, Tariq ibn Ziyad, when they crossed the Strait of Gibraltar to Spain. The Berbers later also launched reform movements in North Africa which greatly influenced the Islamic civilization. In the East, Umayyad rule in Transoxania brought the Arabs into contact with the Turks who, like the Berbers, embraced Islam and, in the course of time, became its staunch defenders. Umayyad expansion also reached the ancient civilization of India, whose literature and science greatly enriched Islamic culture.

In Europe, meanwhile, the Arabs had passed into Spain, defeated the Visigoths, and by 713 had reached Narbonne in France. In the next decades, raiding parties continually made forays into France and in 732 reached as far as the Loire Valley, only 170 miles from Paris. There, at the Battle of Tours, or Poitiers, the Arabs were finally turned back by Charles Martel.

One of the Umayyad caliphs who attained greatness was ‘Umar ibn ‘Abd al-‘Aziz, a man very different from his predecessors. Although a member of the Umayyad family, ‘Umar had been born and raised in Medina, where his early contact with devout men had given him a concern for spiritual as well as political values. The criticisms that religious men in Medina and elsewhere had voiced of Umayyad policy – particularly the pursuit of worldly goals – were not lost on ‘Umar who, reversing the policy of his predecessors, discontinued the levy of a poll tax on converts.

This move reduced state income substantially, but as there was a clear precedent in the practice of the great ‘Umar ibn al-Khattab, the second caliph, and as ‘Umar ibn ‘Abd al-‘Aziz was determined to bring government policy more in line with the practice of the Prophet, even enemies of his regime had nothing but praise for this pious man.

The last great Umayyad caliph was Hisham, the fourth son of ‘Abd al-Malik to succeed to the caliphate. His reign was long – from 724 to 743 – and during it the Arab empire reached its greatest extent. But neither he nor the four caliphs who succeeded him were the statesmen the times demanded when, in 747, revolutionaries in Khorasan unfurled the black flag of rebellion that would bring the Umayyad Dynasty to an end.

Although the Umayyads favored their own region of Syria, their rule was not without accomplishments. Some of the most beautiful existing buildings in the Muslim world were constructed at their instigation – buildings such as the Umayyad Mosque in Damascus, the Dome of the Rock in Jerusalem, and the lovely country palaces in the deserts of Syria, Jordan, and Iraq. They also organized a bureaucracy able to cope with the complex problems of a vast and diverse empire and made Arabic the language of government. The Umayyads, furthermore, encouraged such writers as ‘Abd Allah ibn al-Muqaffa’ and ‘Abd al-Hamid ibn Yahya al-Katib, whose clear, expository Arabic prose has rarely been surpassed.

For all that, the Umayyads, during the ninety years of their leadership, rarely shook off their empire’s reputation as a mulk – that is, a worldly kingdom – and in the last years of the dynasty, their opponents formed a secret organization devoted to pressing the claims to the caliphate put forward by a descendant of al-‘Abbas ibn ‘Abd al-Muttalib, an uncle of the Prophet. By skillful preparation, this organization rallied to its cause many mutually hostile groups in Khorasan and Iraq and proclaimed Abu al-‘Abbas caliph. Marwan ibn Muhammad, the last Umayyad caliph, was defeated and the Syrians, still loyal to the Umayyads, were put to rout.

Under ‘Abd al-Malik (reigned 685–705) the Umayyad caliphate reached its peak. Muslim armies overran most of Spain in the west and invaded Mukrān and Sindh in India, while in Central Asia the Khorāsānian garrisons conquered Bukhara, Samarkand, Khwārezm, Fergana, and Tashkent. In an extensive program of Arabization, Arabic became the official state language; the financial administration of the empire was reorganized, with Arabs replacing Persian and Greek officials; and a new Arabic coinage replaced the former imitations of Byzantine and Sāsānian coins. Communications improved with the introduction of a regular post service from Damascus to the provincial capitals, and architecture flourished (see, for example, khan; desert palace; mihrab).

The decline began with the disastrous defeat of the Syrian army by the Byzantine emperor Leo III (the Isaurian; 717). Then the fiscal reforms of the pious ‘Umar II (reigned 717–720), intended to mollify the increasingly discontented mawālī (non-Arab Muslims) by placing all Muslims on the same footing without respect of nationality, led to the financial crisis, while the recrudescence of feuds between southern (Kalb) and northern (Qays) Arab tribes seriously reduced military power.

Hishām ibn ‘Abd Al-Malik (reigned 724–743) was able to stem the tide temporarily. As the empire was reaching the limits of expansion—the Muslim advance into France was decisively halted at Poitiers (732), and Arab forces in Anatolia were destroyed (740)—frontier defenses, manned by Syrian troops, were organized to meet the challenge of Turks in Central Asia and Berbers (Imazighen) in North Africa. But in the years following Hishām’s death, feuds between the Qays and the Kalb erupted into major revolts in Syria, Iraq, and Khorāsān (745–746), while the mawālī became involved with the Hāshimīyyah, a religio-political sect that denied the legitimacy of Umayyad rule. In 749 the Hāshimīyyah, aided by the western provinces, proclaimed as caliph Abū al-‘Abbās al-Saffāh, who thereby became the first of the ‘Abbāsīd dynasty.

The last Umayyad, Marwān II (reigned 744–750), was defeated at the Battle of the Great Zāb River (750). Members of the Umayyad house were hunted down and killed, but one of the survivors, ‘Abd al-Raḥmān, escaped and established himself as a Muslim ruler in Spain (756), founding the dynasty of the Umayyads in Córdoba.

Legacy

The Umayyad caliphate was marked both by territorial expansion and by the administrative and cultural problems that such expansion created. Despite some notable exceptions, the Umayyads tended to favor the rights of the old Arab families, and in particular their own, over those of newly converted Muslims (mawālī). Therefore they held to a less universalist conception of Islam than did many of their rivals. As G.R. Hawting has written, “Islam was in fact regarded as the property of the conquering aristocracy.”

During the period of the Umayyads, Arabic became the administrative language. State documents and currency were issued in the language. Mass conversions brought a large influx of Muslims to the caliphate. The Umayyads also constructed famous buildings such as the Dome of the Rock at Jerusalem, and the Umayyad Mosque at Damascus.

According to one common view, the Umayyads transformed the caliphate from a religious institution (during the rashidun) to a dynastic one. However, the Umayyad caliphs do seem to have understood themselves as the representatives of God on earth, and to have been responsible for the “definition and elaboration of God’s ordinances, or in other words the definition or elaboration of Islamic law.”

The Umayyads have met with a largely negative reception from later Islamic historians, who have accused them of promoting a kingship (mulk, a term with connotations of tyranny) instead of a true caliphate (khilafa). In this respect it is notable that the Umayyad caliphs referred to themselves not as

khalifat rasul Allah (“successor of the messenger of God”, the title preferred by the tradition), but rather as khalifat Allah (“deputy of God”). The distinction seems to indicate that the Umayyads “regarded themselves as God’s representatives at the head of the community and saw no need to share their religious power with, or delegate it to, the emergent class of religious scholars.” In fact, it was precisely this class of scholars, based largely in Iraq, that was responsible for collecting and recording the traditions that form the primary source material for the history of the Umayyad period. In reconstructing this history, therefore, it is necessary to rely mainly on sources, such as the histories of Tabari and Baladhuri, that were written in the Abbasid court at Baghdad.

Modern Arab nationalism regards the period of the Umayyads as part of the Arab Golden Age which it sought to emulate and restore. This is particularly true of Syrian nationalists and the present-day state of Syria, centered like that of the Umayyads on Damascus. White, one of the four Pan-Arab colors which appear in various combinations on the flags of most Arab countries, is considered as representing the Umayyads.

Islamic Art

The Umayyad period is often considered the formative period in Islamic art. At first, even though Arabic became the official language and Islam the principal religion of the diverse lands unified under Umayyad rule, artists continued to work in their established manner. The main artistic influence came from the late antique classical naturalistic tradition, which had been prevalent on the eastern shores of the Mediterranean. This was also supplemented by the more formal modes developed by the Byzantines and Sasanians, a factor that especially affected metalwork, textiles, and the depiction of animal, vegetal, and figural motifs. With time, however, artists developed new techniques, forms, and decorative conventions that distinguished their works from earlier ones. Thus, through a process of adoption, adaptation, and creation, a new sense of artistic expression emerged that became distinctly Islamic in character shortly after the demise of the Umayyad dynasty.

As with the arts, the Umayyad period was also critical in the development of Islamic architecture. While earlier architectural traditions continued, the requirements of the new religion and customs of the new Arab rulers necessitated a different usage of space. In the case of religious buildings, the Umayyads often constructed their monuments on sites of historical or symbolic significance. The Dome of the Rock in Jerusalem (691), the first major Umayyad architectural undertaking completed under the patronage of the caliph ‘Abd al-Malik (r. 685–705), was built on a prominent site formerly occupied by Solomon’s Temple and later associated with Muhammad’s ascent to heaven. Other renowned religious buildings from the Umayyad period date from the reign of al-Walid (r. 705–15) and include the enlarged mosque in Medina (706–10), the former house of Muhammad. Also significant are the mosques of Damascus (706), where the site of the former Roman temple and fourth-century Byzantine church dedicated to Saint John the Baptist was transformed into the congregational mosque of the Umayyad capital, and of Jerusalem (709–15). In terms of secular architecture, Umayyad desert palaces such as Mshatta, Qasr ‘Amra (Jordan), ‘Anjar (Lebanon), Khirbat al-Mafjar (Palestine), and Qasr al-Hayr East and West (Syria) (all ca. 700–750), are a testimony to the wealth of their patrons and the creativity of Umayyad architects.

Culture and Civilisation of Umayyad

1- THE EMERGENCE OF UMAYYAD SCHOLARSHIP

The Umayyad Arab-Islamic Empire

Islamic science arose in South-West Asia and Egypt. According to Toynbee, this area remained the heart of the whole world, the Oikoumene, for about four thousand years before Islam. With the rise of Islam, and under the Umayyad and the Abbasid caliphates, the area consolidated its position and remained the heart of the civilized world. With the conquest of Iraq, Iran, Syria and Egypt, the Islamic empire inherited the Sassanian and the Byzantine Empires and with them all the ancient civilizations.[3]

The Prophet started the message of Islam in Mecca and Medina, and the call for Islam triumphed during his lifetime in Arabia. Abu Bakr was elected as the first caliph in 11/632. `Umar succeeded him from 13/634 until 23/644. Within a few years during Abu Bakr's and `Umar's caliphates, the Muslim Arabs conquered Syria, Iraq, Iran and Egypt. During Abu Bakr's time the Arabs defeated the Byzantines at the battle of Ajnadin in Palestine in 13/634. In 13/635, Damascus opened its gates for the victorious Arab army. The decisive victory over the Byzantines in Syria was achieved at the battle of al-Yarmuk in 15/636. Jerusalem surrendered in 17/638 and Caesarea in Palestine, the last fortified post, fell in 19/640.

In Iraq the Arab conquest was progressing in a parallel path. The major victory of the Arabs over the Persians took place at al-Qadisiyya in 16/637. The Arabs took over the capital al-Mada'in (Ctesiphon) and drove the Persian army outside the frontiers of Iraq. The fate of Persia was decided at the battle of Nahawand in 21/642 after which all Persian lands surrendered.

As soon as Syria came under Arab rule, the Arab armies were directed to Egypt. The main Byzantine army was defeated at Heliopolis in 20/640. The conquest of Egypt was achieved without much difficulty. Alexandria, the capital, surrendered in 22/642.

The conquest of Syria, Egypt, Iraq and the Persian territories was achieved during 'Umar's caliphate and he can thus be considered the real founder of the Arab-Islamic Empire.

With the rise of the Umayyad caliphate the Arab-Islamic conquests entered their second phase. Within twenty years between 73/692 and 94/712 the Umayyads added North Africa, Spain, Sind and Transoxania to the Arab-Islamic Empire. They, in effect, doubled the size of the Empire, and before the end of their period a major portion of the world, as known then, became part of the Arab-Islamic caliphate.[4]

Historians tried to give various reasons for this spectacular victory which was achieved by the Arab armies. Among these are the exhausting and weakening effects of the wars between the Sassanian and the Byzantine empires.[5] But whatever military or economic factors are cited, the main factor

indeed was Islam itself and the deep faith and zeal of its followers to spread its message to the world at large. This desire to carry the message of Islam created an international empire and resulted in confirming Islam as an international religion, and in ultimately creating an international culture which had a deep influence on the course of human civilization.

Pre-Islamic roots of civilization

The first phase of the conquests united the lands of the ancient civilizations, the valleys of the Nile, Tigris and Euphrates along with the other countries in the area. Here the first civilizations in history arose and developed, and in this same area Islamic civilization arose, flourished and reached its Golden Age. In the new Arab-Islamic Empire the various elements of the Syriac, Hellenistic and Persian civilizations were blended together and formed a fertile compost out of which Islamic civilization grew and blossomed. The old fire was not yet extinguished in its original hearth when the Arabs conquered South-West Asia and Egypt; and with the rise of the Arab-Islamic Empire the fire started to kindle again with vigour at the hands of the Arabs, the new Muslim converts and the Arabized population of the region .[6]

It is not accidental that Islamic science arose and flourished in Iraq, Persia, Syria and Egypt. The first beginnings of science and technology in history took place in this area and from thence were diffused east and west. The Sumero-Akkadian civilization is estimated to have started about the fifth millennium BCE, and the Egyptian in the fourth.

The irrigation systems in Mesopotamia and in the Nile Valley were the mainstay of all pre-Islamic civilizations; and the industrial and technical skills in the cities in such products as textiles, leather, glass, metalworking items and armaments were unmatched. Here the trades and crafts were developed and were handed over from one generation to the other, and so the inherent skills were deeply rooted in the urban societies.

The same can be said about science and culture in general. Science started to develop with the onset of the ancient civilizations of Mesopotamia and Egypt. This tradition continued uninterrupted.

The Hellenistic civilization was principally a Near Eastern one which flourished in this same area; and until the eve of the Arab conquests, Iraq had been the power-house of the Sassanian empire, and Syria and Egypt of the Roman empire and then of Byzantium.[7]

Because Islamic civilization had Islam as its motive force and Arabic as its language, some historians considered this civilization to be based on the pre-Islamic civilization of Arabia only. This led them to consider the Syriac, Hellenistic and Persian cultural elements as 'foreign' elements in Islamic civilization.[8] Islamic civilization is however the civilization of all the peoples who became part of the new society. It had its roots in all the pre-Islamic civilizations of the same area. Besides Islam and Arabic, Syriac, Persian and Greek cultural elements, formed the ancestral traditions of most of the Muslim population. Thus the history of pre-Islam includes that of Arabia and of the lands extending from the western Mediterranean to the Oxus or wherever Islam was established.

The Arab rulers did not disrupt daily life in the conquered areas. The civil administration was maintained, the crafts, trades, industries and agriculture continued as before. Even the original cultural and religious institutions maintained their activities without interruption. The conversion to Islam and to Arabic developed with the passage of time and took a natural course. This policy helped Islamic civilization to have its roots deeply embedded in a fertile soil.

Non-Muslim centres of learning during Umayyad Caliphate

The lands which were incorporated into the Umayyad Caliphate during the first century of Islam possessed ancient centers of learning. By the time the Arabs established their rule, these centers of learning had already moved from Athens to Alexandria and, from thence to Antioch, Edessa and Nisibis. It is also important to know that some esoteric aspects of the Graeco-Alexandrian heritage had also found fertile soil in the cult of the Sabaens of Harran who had developed their metaphysics on the foundation of the Hermetic-Pythagorean ideas of Alexandria and on the Babylonian and Chaldean traditions.

By the time the Arabs arrived in Syria, the Syriac-speaking Christian community had developed characteristic features of its own. In contrast to the Hellenized Christianity of the coastal areas, which used Greek Scriptures, the indigenous Semitic population used Syriac for divine worship. Moreover, Syriac Christianity was more monastic in its general practices than the Hellenized church. In 363 CE the provinces of the Roman Empire east of the Tigris fell to Sassanians and the Syriac Christian community to the east was cut off from the Byzantine Empire and hence from the influences of Antioch or Constantinople.

In addition to Alexandrian Hellenism, the intellectual heritage of Persians and Indians became simultaneously available to the Arabs. During the Sassanid period, the Persian king Shapur I had established a school at Jundishapur where Persian and Indian scholars were active. By the seventh century, this school had integrated the Greek, Persian and Indian sciences and was perhaps unsurpassed in medicine and astronomy.

Muslim centres of learning during the era of the first four caliphs and the Umayyad Caliphate

Arabic and Islamic sciences started to form with the appearance of Islam and the completion of the Qur'an. We can consider the period of the first four caliphs, 'the Well-Guided Caliphs' (al-Khulafa' al-Rashidun) (11-41 /632-661), and of the Umayyad caliphate (41-133/661-750), to be the periods in which the foundations of Islamic sciences were laid. During these two periods the message of Islam was successfully launched and the Islamic Empire reached its final frontiers. These are the periods which witnessed the formation of the new Islamic society and the conversion of the peoples of the old empires to Islam and to Arabic.

Medina was the seat of government during most of the period of the first four caliphs. Here most of the Companions of the Prophet (al-Sahaba) lived, and here Islamic sciences were initiated. Here also most scholars of that period completed their studies in Hadith (Tradition), fiqh (jurisprudence), tafsir (commentary on the Qur'an), and history. Another school arose in Mecca, second in importance to that of Medina.

After the conquests, a number of the Companions of the Prophet left Medina for the new Islamic lands and they formed the nucleus of the new schools which were established in these lands. Basra was the oldest school to be established outside Arabia, and Kufa followed shortly after. Both Basra and Kufa were newly built Arab cities which gained prominence in the history of early Islamic culture.

Basra can be considered the crucible where all the elements of Islamic culture were fused. It was established during 'Umar b. al Khattab's caliphate between 14/635 and 17/638 in a strategic location where sea and land communications meet. It was on the edges of Arabia, Persia and Iraq. It started as a camp for Arab armies for the eastern conquests and developed later into an administrative capital for Khurasan and some eastern provinces. During the eighth and early ninth centuries Basra became a great city with an estimated population of between 200,000 and 600,000. In that period it became an international centre for finance, commerce and culture. Basra therefore possessed all the factors favourable for the rise and the flourishing of culture. It was located in the heart of the most populated and the richest parts of the Islamic Empire. It was a meeting place for all ethnic elements of the empire. A fusion of these elements in Basra was the starting point for the rise of Islamic sciences and culture.

Kufa was established one or two years after Basra on `Umar's orders. `Ali chose it as his capital. It was also of great importance because of its geographical position in Iraq, the richness of which was noted above. Kufa became an important centre for a cultural movement and was the rival of Basra in this respect. When the seat of the caliphate moved to Damascus during the Umayyads, the new capital also became an important cultural centre, in addition to Medina, Mecca, Basra and Kufa.

During this first period, the philosophical and rational sciences were still active, to a certain extent, in their original sites in Alexandria, Jundishâpûr, and in the schools of northern Syria.

In this first period the new society in the above cultural centres was in the formative stage, and the foundations of Arabic, religious, philosophical and rational sciences were being laid.

The beginnings of Arabic and religious sciences

Immediately after the death of the Prophet in 12/633, Abu Bakr asked Zayd b. Thâbit to collect the Qur'ân and to record it, and in 30/650-651, on the orders of `Uthman, Zayd completed the final edition which has remained in use ever since. The recording of the Qur'an was an event of great historical significance because it heralded into human culture a new language which was destined to remain the international language of science for several centuries.

The importance which the new language assumed due to the spread of Islamization and Arabization among non-Arabs led to the appearance of Arabic grammar. It is reported that Abu al-Aswad al-Du'ali (fl. 89/688) was the first to lay the foundations of this science in Basra.

Al-Hajjaj b. Yusuf al-Thaqafi (d. 96/714) was instrumental in developing the school of Basra and he is said to have introduced into Arabic the consonantal points and vowel marks.

Al-Khalil b. Ahmad (d. 170/786), another scholar from Basra, compiled al-'Ayn, which was the first dictionary in the Arabic language. He also developed Arabic prosody. His pupil Sibawayh (d. 179/795), who was of Persian origin, wrote the first systematic presentation of Arabic grammar in al-Kitab (literally: The Book). Sibawayh was a typical scholar from the new Arabic-Islamic generation which replaced the pre-Islamic communities.

Muslim scholars started at an early date the study of the Qur'an and thus the sciences of readings and interpretation developed. In addition to the Qur'an, scholars paid great attention to the sayings of the Prophet and thus began the science of Hadith (Tradition). The Qur'an and Hadith formed the basis on which fiqh (jurisprudence), and Usul al-din (Fundamentals of Islam) were developed. All these new religious sciences were studied in the schools of Medina, Mecca, Basra, Kufa and Damascus.

In this early period appeared Abu Hanifa al-Nu'man, who was born in Kufa in 81/700 and died in Medina in 151/768. He is the founder of the Hanifite School of jurisprudence, which is the oldest and the most widespread of the four Islamic Orthodox fiqh schools. It is of interest to know that Abu Hanifa's grandfather was a Persian, which is an indication that the new Islamic society had already started to bear fruit.

The rise of sects and cultural movements during the Umayyad's Caliphate

It was natural to see the appearance of some sects and cultural movements within Islam. These sects and movements were often caused by political factions, and in some cases they were purely intellectual. Besides the followers of Orthodox Islam (Sunna), the .Shi'a was the next Islamic party in importance and in numbers. The Khawarij were among the oldest religious groups and from this movement there remained the Ibàdis, who are followers of `Abdallâh b. Ibad who lived in Basra around 61/680.

Among the religious and philosophical movements of intellectual origin was the Qadariyya, which adopted the concept of freedom of will. This movement appeared in Damascus. The Qadariyya was opposed to the Jabriyya or al-murji'a, the Determinist movement.

An important intellectual movement, the Mu'tazila, appeared in Basra. It is said sometimes that it was influenced by the Qadariyya, and some maintain that the Mu'tazila was a continuation of it. One of its founders was Wasil ibn 'Ata' (d. 131/748). The Mu'tazila played a prominent role in Islamic thought, and the movement reached its zenith during the reign of al-Ma'mun, in Baghdad.

Among the religious-political movements was al-Murji'a. It is generally maintained that this movement accepted the rule of the Umayyads, contrary to the Shi'a and al-Khawarij. The attitude of al-Murji'a was that of tolerance: and in this atmosphere of tolerance lived Abu Hanifa, and this had some influence on his teachings.[9]

It seems that the appearance of al-Qadariyya, al-Jabriyya and al-Murji'a in Damascus took place at a time when Christian religious schools were flourishing. The Umayyad caliphs were tolerant towards Christians and the followers of other religions, which encouraged the dialogues between Christianity and Islam in Damascus. Christian clerics were experienced in the art of dialectic, and Muslim scholars were obliged in the dialogue with them to learn the same philosophical reasoning and use the same dogmatic subtleties. In this period appeared Yahya al-Dimashqi (John of Damascus) (d. 132/749) and Theodore Abu Qurra (Abucara). In his youth John was a companion to Yazid, who became the second Umayyad Caliph, and later, John became a high government official in the Umayyad court. He adopted the profession of his father and grandfather. John left dialectic essays in which he compared Islam with Christianity; his essays reflect those dialogues, which took place in Damascus between the scholars of both religions.

Within the Christian Church itself there was a debate about fate and free will, and about hell and the eternity of punishment. Similar debate on these same subjects took place in Islamic theological circles, which led to the appearance of the intellectual movements just mentioned [10]

2- ARCHITECTURE AND TECHNOLOGY OF THE Umayyads[11]

The Arabization of the diwans, as we shall see later and the translation of elementary scientific texts that are required for the kuttab of the diwan is closely related to some aspects of Umayyad technology.

Unlike the theoretical sciences, architecture and technology do not need a long period before they can flourish. Here things were different. Hence the achievements of the Umayyad caliphs in architecture and technology were prominent.

We have pointed out that the new Islamic regions were the most advanced in their civilization. In these regions arose the first and the most important civilizations in history. Syria, Egypt, Iraq and Persia were rich in their industries and agriculture. There were skilled craftsmen, farmers and engineers. After the conquests, industrial and agricultural production continued uninterrupted. The process of conversion to Arabic and to Islam within the ranks of craftsmen and farmers was taking place gradually without having any adverse effect on their daily economic activities. On the contrary, the new religion and the new state infused a new life into all aspects of the economy and into all trades and crafts.

There was a large public sector under the direct control of the state and large projects were undertaken.[12]

Early Islamic Cities and Umayyad Architecture

A unique feature of Islamic civilization was its creation of new cities right from the early period. 'Umar ibn al-Khattab built the cities of Basra in 16/637 and Kufa in 17/638 as city camps for the Islamic armies. These developed and grew until they became great cities which influenced profoundly the political and cultural history of Islam. 'Umar also built in Egypt the city of Fustat in 21/641-642. During the time of the Umayyads, 'Uqba ibn Nafi' built al-Qayrawan in North Africa in 50/670 during Mu'awiya's caliphate. Sulayman ibn 'Abd al-Malik (97-100/715-718), built al-Ramla in Palestine, and al-Hajjaj built Wasit in Iraq. The Umayyads also developed and increased the size of several older cities.

The building of new cities and the development of the old ones was accompanied by the construction of an appreciable number of mosques and palaces. The most famous of these buildings were the Dome of the Rock and the Aqsa Mosque in Jerusalem, the Great Mosque in Damascus and a series of palaces on the edges of the desert which were built for the Umayyad caliphs or their sons.

The construction of the Dome of the Rock was started by 'Abd al-Malik in 68/687 and was completed in 72/691. 'Abd al-Malik also constructed the Aqsa Mosque which was rebuilt several times after that. The construction of the Great Mosque in Damascus was started in 87/705 by al-Walid and it was completed in 97/715. These three great mosques are still in existence and they retain till now their original splendour.

Among the Umayyad palaces whose remains are in existence is al-Mashatta Palace south of Amman. It is one of the important Umayyad palaces and was probably built by al-Walid II around 126/743. Another important palace is Qusayr 'Amra east of Amman. It was built according to some historians during the caliphate of al-Walid I between 94/712 and 97/715 but other historians believe it was built by Hisham ibn 'Abd al-Malik (106-126/724-743). It is famous for its magnificent wall illustrations. The Khirbat al-Mafjar in Jericho is considered the largest and the most beautiful among the Umayyad palaces, and it was probably built by Yazid III in 127/744. There are two great palaces which are also attributed to Hisham ibn 'Abd al-Malik; these are Qasr al-Hayr al-Sharqi and Qasr al-Hayr al-Gharbi. They lie near the city of Palmyra (Tadmur). The Eastern Palace (al-Sharqi) was built in 111/729 and the Western (al-Gharbi) in 110/728.

In studying these early Islamic masterpieces of architecture one must remember that the new Islamic lands were rich in craftsmen of all trades. These craftsmen inherited the skills of the civilizations of the Near East generation after generation, and they became an important part of the new Islamic society. They however adapted their skills to conform with the spirit of Islam and thus there developed an Arabic or Islamic art and architecture.

The same thing happened in all the other Islamic lands. And so different schools of Islamic art arose in the various Islamic lands, which were influenced by the inherited arts of the different regions.

About this early period we can say that Islamic architecture started during the Umayyad period. The Umayyads left glorious architectural monuments each with a unique Islamic style, and this Umayyad architecture was a remarkable starting point from which later Islamic architecture has developed [13]

Irrigation

Irrigation works and water distribution were very prominent among the state's achievements. The Islamic religion considered these among the chief duties of the state. When Basra was established during 'Umar's period, he started simultaneously building some canals for conveying drinking water and for irrigation. Al-Tabari reports that 'Utba ibn Ghazwan built the first canal from the Tigris River to the site of Basra when it was in the planning stage. After the city was built, 'Umar appointed Abu Musa al-Ash'ari as the first governor. Al-Ash'ari governed during the period 17-29/638-650. He began building two important canals linking Basra with the Tigris River. These were al-Ubulla River and the Ma'qil River. The canals were completed under the later governors and thus Basra obtained the necessary drinking water, and the two canals were the basis for the agricultural development for the whole Basra region. 'Umar also devised the policy of cultivating barren lands by assigning such lands to those who undertook to cultivate them. This policy continued during the Umayyad period and it resulted in the cultivation of large areas of barren lands through the construction of irrigation canals by the state and by individuals. Al-Baladhuri gives the names of several canals which were constructed during this period to cultivate barren lands.

The various governors who were appointed by the Umayyads constructed several works to prevent the formation of new swamps and to dry old swamps, through the building of dams which regulated the flow of water.

We find in the original Arabic sources much detail about the irrigation works which were constructed in Iraq in the regions of Basra, Kufa, Wasit, al-Raqqah and several other areas. Al-Hajjaj was particularly active in constructing irrigation works and the later governors followed his policy.

One of the Umayyad caliphs, Yazid ibn Mu'awiya, was so interested in irrigation projects that he was called al-Muhandis, 'the Engineer'. In addition to his interest in the irrigation works in Iraq he improved the water distribution canals of the Barada River in Damascus. One of these canals, Nahr Yazid or the Yazid River, still carries the name of that Umayyad caliph in commemoration of his great service.

The caliphs and the governors utilized in these irrigation works the hereditary skills of the people of Iraq. The Nabataeans for instance were skilled in agriculture and in irrigation works, and among the great engineers who worked under al-Hajjaj to drain the swamps in southern Iraq was Hasan al-Nabati (the Nabataean).

Norias (al-nawa'ir), or the large water-wheels which were driven by the flow of water and raised water to a greater height, were used on large scale on the Tigris and the Euphrates. They were used

also on the Orontes (al-'Asi River) and on al-Khabur River which is a tributary of the Euphrates River. The saqiya, or the animal-driven pot wheel, was also used extensively.

For power purposes the water mill was also well established. The first mention of the windmill in the Islamic period occurs during 'Umar's caliphate, when Abu Lu'lu'a told 'Umar that he could build an air-driven mill.[14]

Industrial chemistry

Numerous trades and crafts of the Umayyads are of the industrial chemistry type. We shall mention some of them only.

The metallurgy of gold and silver –the mint

Abd al-Malik ibn Marwan decided to mint the Arabic dinar and to liberate the economy from dependence on the Byzantine dinar and on the Persian one. This took place in 76/695 following the Arabization of government records. This financial reform had far-reaching consequences and it is considered one of the major achievements of the Umayyads. The Islamic gold dinar abolished the Byzantines' monopoly of golden currency. The economy of the Islamic countries was thus liberated and a new era of Islamic financial supremacy on the international scene was established. The appearance of the Islamic gold dinar and the silver dirham implied the adoption of elaborate measures in the mining of gold and silver and in strict and effective controls of the mint and of the circulation of coins.[15]

The mint of the Arabic dinar required that part of the duties of the administrator of the public treasury (bayt al-mal) was to see to it that the right proportion of gold is cast in the minted dinars, together with what all that implies by way of managing alloys, composition of metals, and exacting weights and measures. Such functions included some alchemy which was then called 'ilm al-san'a , that was being sought by Khalid ibn Yazid.

We are told by Abu Hilâl al-'Askari (c. 1000) in his kitab a!-awa'il that:

"Abd al-Malik ibn Marwan started to write surat al-ikhlas (Qur'an, 112) and the mention of the prophet on the dinars and dirhams, when the king of Byzantium wrote to him the following message: 'You have introduced in your official documents (tawamir) something referring to your prophet. Abandon it, otherwise you shall see on our dinars the mention of things you detest.' That angered Abd al-Malik, so he sent for Khalid ibn Yazid ibn Mu'awiya, who was greatly learned and wise, in order to consult with him upon this matter. Khalid then told him, 'have no fear o commander of the faithful! Prohibit their dinars and strike for the people new mint with the mention of God on them, as well as the mention of the Prophet, may prayers and peace be upon him, and do not absolve them of what they hate in the official documents. And so he did!'"[16]

The metallurgy of iron and steel

The iron and steel industry existed in Damascus before the Arabs had arrived, and Damascenes swords were renowned throughout the Roman Empire.

The composition of steel was first described by Jabir ibn Hayyan, and at later dates by al-Kindi and al-Biruni. The dus, a component of steel, was a main material in alchemical treatises such as in the works of al-Razi.

Al-Biruni gave a quotation from a book written by a Damascene ironsmith called Mazyad ibn 'Ali. Mazyad gave a description for making crucible steel. Al-Biruni says that Mazyad's book gives details of swords that were described in al-Kindi's treatise on swords. We understand from al-Biruni's statement that Mazyad ibn 'Ali lived in Damascus before the time of al-Kindi. And since al-Kindi flourished in the ninth century in Baghdad, it is reasonable to assume that Mazyad ibn 'Ali lived during the time of the Umayyad Caliphate in Damascus. [17]

Recipes for lustre glass

Lustre-painting, which is characteristic of Islamic glass and pottery, is a metallic sheen applied on the surfaces of glass or pottery objects. Its origin has been the subject of discussion amongst historians, the suggested centres being, Syria, Iraq, Egypt or Iran.

According to the latest reported archaeological finds, the earliest existing examples of lustre glass were of Syrian origin during the Umayyad period.(660–750).[18]Numerous Umayyad glass lustre fragments have been found at Qasr al-Hayr al-Sharqi[19] that was built in (728–9) by the Umayyad Caliph Hisham ibn Abd al-Malik, who ruled between 723 and 742. In addition, the glass found at the ancient site of Pella[20] in Jordan included Umayyad lustre-painted and gilded fragments.[21]

Since lustre glass was used in Qasr al-Hayr al-Sharqi, it is reasonable to assume that the technique of lustre painting was developed in Syria at an earlier date in the same century or even before. This assumption seems reasonable because Jabir, who was writing in the second half of that century, gave a large number of recipes for this art, some of which may have been formulated by him and some may have been compiled from previous practice. The accumulation of such a large number of mature recipes requires several decades of industrial experience.

Apart from these early fragments of Umayyad lustre glass, an extant lustre painted glass cup from Fustat is dated 163/779 and another cup from Damascus is dated 170/786.[22]

Books on gemstones

Al-Biruni mentions in al-Jamahir that he had acquired a book written in Damascus during the caliphate of Abd al-Malik ibn Marwan. The book deals with the qualities of gemstones and their values. Al-Biruni says that according to this book the red ruby and the good quality pearls were of equal value at that time.[23]

Industrial recipes in general

Al-Biruni's reports are of utmost importance. They confirm that there were books from the Umayyad period about iron and steel and about gemstones. Most of these Umayyad books were lost but we find also in al-Fihrist of ibn al-Nadim the titles of several books whose authors are not known.

Jabir's recipes were either inherited or developed. For recipes that were not developed by him, he alluded sometimes to their sources, and that he collected some of them. He says for example that he took a waterproofing recipe from Al-Fadl ibn Yahya ibn Barmak who also took it from a manuscript of unknown author, since the first pages and the last ones were missing. Moreover, when Jabir describes the manufacture of the adrak gemstone, he says that he took it from a valuable manuscript. [24]

The recipes of Jabir that he gave in Kitab al-durra al-maknuna and in Kitab al-khawass al-kabir and in other practical works, are taken from earlier books of recipes.[25] And since Jabir flourished in the eighth century, his sources must belong to the Umayyad period.

The weapons industry

During the early Arab conquests the weapons of war consisted of light weapons which comprised mainly the sword, the lance and the bow and arrow. These weapons were made in Arabia, and the different kinds of swords, lances and bows carried the names of the places where they were made. After the conquests of Syria, Iraq, Egypt and Persia the technical skills of these countries in the manufacture of weapons had enhanced greatly the capabilities of the Islamic weapons industry. Damascus for instance was famous before Islam in the manufacture of weapons and of steel blades and this fame had increased greatly after Islam.

From `Umar's time, the state undertook to provide the regular soldiers, who were unable to secure their own weapons, with the necessary equipment. Such weapons which were supplied by the government were specially marked. 'Ali established the armouries or weapons warehouses (khaza'in al-silah), and he marked the government's weapons with special signs.

Besides light weapons, the Islamic armies used siege equipment, especially the manjaniqs (catapults). It is reported that the Prophet used the manjaniq in his siege of al-Ta'if. It is reported also that some Companions of the Prophet received in Jerash some training in the construction of manjaniqs and other siege engines. The use of these machines by the Islamic armies increased during the conquests of Iraq, Syria and other countries.

The construction, operation and maintenance of siege engines was the government's responsibility from early Islamic times. It is reported that 'Amr b. al-'As constructed manjaniqs upon his arrival in Egypt and he used them in Egypt's conquest. The use of these siege engines increased during the Umayyad period. Marwan b. Muhammad (127-32/744-49), the last of the Umayyad caliphs, in his siege of Homs in 127/744. used more than eighty manjaniqs according to Ibn al-Athir.

Military fires

The use of military fires was known to the Umayyads. In 64/683 al-Ka'ba was bombarded by stones, naft and other combustible burning fires. Military fires were used also by the Islamic fleets in the Mediterranean during the Umayyad campaigns.

The use of naft by the Umayyads was a natural development. It should be remembered that chemical technology had reached an advanced stage in the area in pre-Islamic times. Even the Greek fire which was used by the Byzantines was brought to them by the Syrian engineer, Kallinicus, who fled from Baalbek in Syria to Constantinople in 59/678 during the Umayyad period. Kallinicus was brought up in Syria during the Islamic era where he received his training in chemical technology.[26]

Dar al-Sina'a and the Islamic fleets

One of the major achievements of 'Uthman b. 'Affan was the creation of the first Islamic naval power. But a great deal of credit should go to Mu'awiya, who pursued this objective when he was governor of Syria during 'Uthman's caliphate and after he became caliph himself. Mu'awiya realized that Arab-Islamic rule in Syria and the other new Islamic Mediterranean countries could not be consolidated without an Islamic naval power which could repulse the Byzantine naval attacks. The policy of Mu'awiya was followed by his successors, and Islamic naval power enabled the Umayyads to continue their conquests until all of North Africa and Spain came under Islamic rule.

During 'Umar's caliphate, Mu'awiya established the ribat system. The ribats were fortresses built near the coastal cities in which military forces were kept to defend these cities against the Byzantine attacks. They served also as shelters for people during such raids.

These fortresses contained rooms and lodgings for the soldiers, armouries, storage for food and observation towers. Later on, the ribat developed into bases for undertaking naval campaigns.

During 'Uthman's caliphate the governor of Egypt, 'Abdallah b. Abi Sarh, started the building of naval ships in Egypt, utilizing the skills of Egyptian craftsmen. The close cooperation between Mu'awiya and Ibn Abi Sarh enabled the Muslims to occupy Cyprus in 28/649, and Rhodes in 33/654. In 34/655 the combined Islamic fleet of Syria and Egypt defeated the Byzantine fleet near the coast of Lycia in the Battle of the Masts (Dhat al-Sawari). This battle was a fatal blow to Byzantine naval power and it heralded the beginning of Islamic supremacy in the Eastern Mediterranean.

Mu'awiya became caliph in 41/661. In 49/669 he chose 'Akka (Acre) as a site for the first dar al-sina'a (arsenal or shipyard) in Syria. He recruited for this purpose craftsmen and carpenters from various places in Syria. During Mu'awiya's caliphate the Islamic fleet besieged Constantinople twice, in 49/668 and during the seven years' war between 54/674 and 60/680.

The strongest siege of Constantinople took place in 98/716 during the caliphate of Sulayman ibn 'Abd al-Malik. The Islamic fleets from Syria, Egypt and North Africa participated in this siege and the Arabs used military fires and some types of artillery.

The Umayyads adopted the same policy in North Africa. Hassan al-Nu`man was appointed in 76/695 as governor by 'Abd al-Malik ibn Marwan and he established a naval base in Tunis with a shipyard. He was succeeded in 79/707 by Musa b. Nusayr, who continued the policy of his predecessor in the building of naval ships. During Nusayr's period as governor, Spain was conquered and the Islamic fleet played a major role in that historic campaign: [27]

Al-tiraz

High-quality textiles were manufactured in state factories known as tiraz. Such textiles were woven for caliphs and high officials and were presented to important persons. Textiles included the linen fabrics of Egypt and the silk and brocade cloths of Damascus. The caliphs established the tiraz factories in their palaces which were managed by the sahib al-tiraz who was in charge of spinners and weavers, paying their wages and controlling the quality of their work.

Al-tiraz factories acquired great importance under the Umayyads and they continued in importance during the Abbasid period. `Abd al-Malik changed the inscriptions on the borders of the tiraz textiles into Arabic-Islamic writings. Before that the tiraz inscriptions followed Byzantine, Sassanian or Coptic traditions.

Papyrus (al-qaratis)

Al-qaratis were used for writing. They were manufactured in Egypt out of papyrus. This industry was also under state control. 'Abd al-Malik replaced the Coptic signs on the qaratis by Islamic writings. The use of the qaratis continued until paper factories were established during the Abbasid period

The mail service (al-barid)

`Abd al-Malik also established a mail service, al-barid, connecting the far regions of the vast empire with each other. This system was utilized by al-Walid and the other succeeding caliphs in undertaking and organizing several important projects. Al-barid continued to increase in importance during the Abbasid caliphate.

3- ARABIZATION OF THE ADMINISTRATION AND THE START OF TRANSLATION

Arabization of the diwans

Without the arabization of the administration by Abd al-Malik ibn Marwan the translation movements that followed, including that of Bayt al-Hikma in Baghdad in the ninth century, could not have taken place. This Arabization of the administration by the Umayyads was a crucial step towards making Arabic the language of culture throughout the whole empire.

The translation of the diwans from Greek into Arabic in Syria took place during the reign of the Caliph Abd al-Malik ibn Marwan under his personal supervision. They were translated from Persian to Arabic in Iraq and beyond by al-Hajjaj the governor of Abd al-Malik. In Egypt, the diwans were translated from Coptic into Arabic by Abd al-Aziz ibn Abd al-Malik the governor of Egypt.

The historic arabization reform of Abd al-Malik took place at the same time when Khalid ibn Yazid undertook the translation of scientific works from Greek into Arabic. Khalid was greatly respected and esteemed by the Caliph Abd al-Malik ibn Marwan, and he advised the caliph on the mint of the Arabic dinar and the arabization of the administration.

The diwan operations dealt with accounting procedures which required handling arithmetical operations carried over fractions and the like.[28] Therefore the diwan that needed translation into Arabic was the diwan in which such complicated operations were performed. Therefore, the diwan that was translated into Arabic was the diwan of revenues, and revenues were the backbone of any government then, as now

Since procedures dealing with revenues required arithmetical operations for such functions as the surveying of real estates, a diwan officer, as a revenue collector should have the qualifications to carry out those procedures.

Furthermore, the computation of time in solar years, when taxes should be paid, is not always easy to calculate without some elementary astronomical knowledge. That too must have forced the diwan officer to learn some astronomy. Elementary operations involved also the re-allocation of payments, especially after the distribution of inheritance, the digging of canals, etc., all of which necessitated that the said officer acquire such computational skills. for which Muhammad ibn Musa al-Khwarizmi had to compose a complete book on Algebra just for that same purpose.

The operations which a diwan officer was supposed to perform were not easy, and there must have been some elementary texts or manuals that were used to train those who worked in the diwan.

We do find in the work of Ibn Qutayba (d. 879) who himself was a contemporary of the last period of translation that followed the translation of the diwan, a short synopsis of the qualification of those who sought employment in the diwan, or those who were then called kuttab. Those kuttab were undoubtedly the heirs of the diwan employees.

In his book *Adab al-katib*, Ibn Qutayba stresses that the katib must seek the following sciences, if he were to be worthy of the name katib, and not be among those who are after the office of katib in name only:

"He must-in addition to our books, investigate matters relating to land surveying, so that he would know the right angled triangle, the acute, and the obtuse angled triangle; the vertical plumb lines (masaqit al-ahjar), the various squares (sic), the arcs and the curves, and the vertical lines. His knowledge should be tested on the land and not in books, for the one who reports is not like the eyewitness. And the non-Arabs ('ajam) used to say: 'whoever was not an expert in matters relating to water distribution (ijra' al-miyah), the digging of trenches for drinking water, the covering of ditches, and the succession of days in terms of length increase and decrease, the revolution of the sun, the rising of the stars, the conditions of the moon when it becomes a crescent as well as its other conditions, and the control of weights, and the surface measurement of the triangle, the square, and the polygons, the erection of arches and bridges as well as water lifting devices and the norias by water side, and the conditions of the artisans and the details of calculations, he would be defective in his crafts"

Working in the diwans, as far as Ibn Qutayba could ascertain, should include a mastery of all those sciences that were just listed by him. This must mean that the diwans that were translated must have included the elementary texts of those sciences. For it was quite unlikely that Ibn Qutayba would call on the kuttab of his time to acquire these sciences if there were not any texts through which they could be acquired.

Another confirmation of the sciences needed for the kuttab of the diwan comes from another scientist who was also interested in the education of the kuttab and government bureaucrats. Several of his books have reached us from about the middle of the tenth century. The author in question was the famous scientist, Abu al-Wafâ' al-Buzjani (d. 998), whose name was very closely associated with the Greek mathematical and astronomical works that were translated into Arabic. It was this Abu al-Wafa' who had left us two books which directly address the geometric and arithmetical needs of the artisans and workers (obviously including government employees), that were called: What the Artisans need by way of Geometry, and What the workers and kuttâb need by way of Arithmetic [29]. In both of these texts, Abu al-Wafa' takes up elementary mathematical problems, of the types that were obviously discussed in the diwans of his time, or among those who were employed in those government departments who were then learning how to carry out the new functions that required those new sciences.

These examples are intended to confirm the meaning of the diwan that was arabized by Abd al-Malik ibn Marwan. We conclude that the translations of the Persian and Greek diwans into Arabic must have included a group of elementary scientific texts. To embark on such an ambitious arabization program, the Umayyad government of Abd al-Malik must have provided manuals for such elementary sciences for its employees in order for them to function in an efficient manner.

4- RATIONAL SCIENCES OF THE UMAYYYADS

If we contemplate the history of any civilization from its beginning, to its climax and then to its decline, we shall realize that nations were interested only in those sciences that are required for their daily needs, and they gave attention to advanced theoretical sciences after a long time only. In Islamic civilization attention was directed first of all to medicine, astrology and alchemy.[30]

Philosophy

We have discussed the appearance of the Islamic intellectual movements and the debates which took place among Muslim scholars themselves and between them and Christian scholars in Damascus under the Umayyad caliphs. To acquire the necessary tools for these debates Muslim scholars turned eagerly to study the philosophical and logical tools which were employed by their opponents. Logic as a tool in discussions and arguments was especially important. Our knowledge about the philosophical books that were translated into Arabic during the Umayyad period is limited. But we learn from Ibn al-Nadim that Thawon may have translated *Categories*: from Syriac into Arabic. Istfan is also mentioned as a translator for Khalid ibn Yazid and he may have translated *Categories*.

Hisham ibn Abd al-Malik paid great attention to translation. Ibn al-Nadim mentions that Salim Abu al-'Ala' the katib or secretary of Hisham translated for him the epistles of Aristotle to Alexander. Al-Mas'udi reports also that *Kitab siyasat al-furs* (*Policies of the Persians*) was translated for Hisham. This is a great book which contains many of the Persian sciences, the tales of their kings, their buildings and their policies. [31]

Beside these translations of the caliphs there were individuals who sponsored some translations for their own personal use.

Medicine

Said b. Ahmad al-Andalusi says in his book *Tabaqat al-umam* (*Classification of Nations*) that 'the Arabs at the dawn of Islam paid attention only to their language and to the aspects of Islamic law, with the exception of medicine which was practiced by some individuals and was appreciated by common people because everybody was in need of it.' [32]

The Prophet spoke about medicine, health, illness, protection against infection and the merits of physicians. There are about one hundred sayings of the Prophet discussing these topics which were collected and are referred to as *al tibb al-nabawi* (the medicine of the Prophet). The Prophet also encouraged people to consult the physicians.

The most prominent Arab physician during the Prophet's period and during Abu Bakr's caliphate was al-Harith b. Kalada, who was called the Physician of the Arabs. It is reported that he died in 11-13/632-634. It seems that al-Harith studied medicine in Jundishapur and he was familiar with medical books either in Greek or Syriac or both. Some reports claim that al-Nadar b. al-Harith b. Kalada succeeded his father as a physician.

When Damascus became the seat of the Umayyad caliphs they relied on the physicians of the new Islamic countries who studied medicine at Alexandria, Antioch and Jundishapur, which were the cultural centres for the study of the rational sciences, especially medicine. At that early period most

physicians were Christians because the conversion movement to Islam was in its early stage. We see here however the first beginnings of translation of medical works into Arabic.

Among the physicians of the Umayyads were Ibn Athal, Mu`awiya's physician, and Abu al- Hakam al-Dimashqi who served under Mu`awiya and several later caliphs. One of the prominent physicians of this period was Tayadhuq, who was the physician of al-Hajjaj. Tayadhuq wrote three or four medical books which have not come down to us.

Another prominent physician from Basra was Masarjawayh, who was a Jew from Persia. He translated from Syriac into Arabic a medical book written originally in Greek by Ahron (or Ahren). It is possible that this was the earliest translation into Arabic of a medical work that had a Greek origin. The Arabic title is al-Kunnash which means in Syriac ' a medical summary'. This book contained thirty chapters. The author Ahren lived in Alexandria during the reign of Hiraql (Heraclius) in the period 610-641. It was translated into Syriac and was popular among the Syrians.

The Kunnash was translated during the reign of Marwan ibn al-Hakam, 64/784 – 65/685. Ibn Abi Usaybi'a mentions in 'Uyun al-anba' fi tabaqat al-atibba' that the Caliph 'Umar ibn 'Abd al-Aziz found this book in the libraries of Damascus and he ordered that it should be made public and be accessed easily by the general public.[33]

Among the physicians of this period also was `Abd al-Malik ibn Abjar al-Kinani, who was teaching medicine in Alexandria, and was a physician to `Umar ibn `Abd al-`Aziz when the latter was governor of Egypt. When `Umar became caliph, he invited him to move to Syria, and thus the teaching of medicine moved to Antioch.

The first hospitals in Islam

It is important to mention in this brief survey that the Umayyads established the first hospitals in Islam. The first proper hospital was established by al-Walid ibn 'Abd al-Malik (d. 96/715). In this hospital patients affected with leprosy were isolated in special quarters and received special care.

Astronomy and astrology

Important astronomical activities were still going on in Syriac during this period. Syriac scholars were still active in writing in Syriac and in translating from Greek into Syriac. Among these scholars was Severus Sebokht, who was born in Nisibin and lived in Qenneshrin (Qinnisrin) near Aleppo. Sebokht flourished in the middle of the seventh century and wrote a treatise on the astrolabe and wrote on other astronomical subjects. Another scholar was George, bishop of the Arabs (d. 106/724) who lived in upper Mesopotamia and was bishop of the Arab tribes. He composed a poem on the calendar.[34]

The first effect of Islam on astronomy was the adoption of the lunar calendar for Islamic history which starts on 15 July 622. In more than one verse, the Qur'an urges Muslims to study astronomy. For practical purposes also Islam had a great influence on the development of this science when astronomers worked actively in compiling astronomical tables and in determining the direction of al-qibla from various geographical locations.

There are reports on translations of astrological and astronomical works into Arabic in this period. Khalid ibn Yazid ordered the translation of some works on astrology.

The Umayyads showed clearly an interest in Greek astrology and astronomy. The little Umayyad audience hall and bath of Qasr 'Amra, located in present-day eastern Jordan around A.D. 711, contains on the inside of the dome, a painted representation of the zodiac made on a stereographic projection.

A book on astrology that was translated from Greek unto Arabic was Kitab 'ard miftah al-nujum which is attributed to Hermes. A copy of it is found in Milano at the Ambrosian Library. At the end of the manuscript it is written that the translation was made in Dhi al-Qi'da in 125/743.

There were arguments by Muslim astrologists in support of the practice of astrology including the use of court astrologers by the Umayyad caliphs. The Islamic ruling on horoscopes is that they are forbidden.

In spite of this the Umayyad Caliphs and the governors of the realms used to consult astrologers. It is reported by al-Mas'udi that Abd al-Malik ibn Marwan (the contemporary of Khalid ibn Yazid) was fond of astrology and that he used to have in his company some astrologers during his campaigns.[35]

Similarly Al-Hajjaj ibn Yusuf al-Thaqafi consulted astrologers and he had his own astrologer. There are some historic stories about al-Hajjaj and astrologers.

One story is about the astrologer of al-Hajjaj. Al-Hajjaj placed in his hand some pebbles of known number. He asked the astrologer, tell me: how many pebbles do I have in my hand? The astrologer made some calculations and he gave the correct answer. Then al-Hajjaj, without letting the astrologer notice him, took in his hand a quantity of pebbles which he did not count. The astrologer made some calculations and he gave the wrong answer. He repeated his calculations but the answer was still wrong. Then the astrologer said: O prince, I think that you do not know how much is in your hand. Al-Hajjaj said, no. but what is the difference? The astrologer answered; the first pebbles were counted by you and they were outside the realm of the un-known, The second pebbles were not counted and they remained in the realm of the un-known. And only God knows what is in the realm of the un-known.

Umayyad scholars and scientists who continued during the early Abbasid period

The early Abbasid caliphs relied on physicians, astrologers, alchemists and other scholars of the Umayyad period who were already accomplished.

The Islamic scientific community had already entered the formative stage. Syriac scholars became versed in Arabic as a result of Abd al-Malik ibn Marwan's arabization of the administration and of adopting Arabic as the language of culture and science. Persian secretaries and employees of the diwans were obliged to use Arabic only. The academic community in Jundishapur adopted Arabic also beside the other languages of Persian, Syriac and Greek.

There were workshops established in Iraq and Persia to train secretaries in working with Arabic.[36] Apart from secretaries, it seems that there were avenues by which astronomers and

astrologers were given a thorough training either through individual tutoring or by receiving their training in groups.

One of the scholars who lived most of his life under the Umayyads was Abd Allah ibn al-Muqaffa' who was born in 720 in Jur in Fars and died in 756 at the age of 36 in al-Basra.

Ibn al-Muqaffa's father was one of Umayyad secretaries in Iraq and Ibn al-Muqaffa', the son, was trained as a secretary also, and served under the Umayyads.

Ibn al-Muqaffa' was one of the Persian aristocratic class of secretaries and he was involved in politics. Most of his literary work was written during the Umayyad period. And during the Abbasid period he was involved in the struggle for the caliphate between the contenders. This led to his execution by Abu Ja'far al-Mansur.

Ibn al-Muqaffa's translation of *Kalīla wa Dimna* from Middle Persian is considered the first masterpiece of Arabic literary prose. The translation was done while he was still an Umayyad official.

During his years in Fars and Kerman as an Umayyad official, Ibn al-Muqaffa' had time for his remarkable intellectual activity, and may well have organised a translation workshop. [37] Whether or not there were schools of translation in Damascus during the Umayyads' rule, is open to question

Beside *Kalila and Dimna*, an important book of maxims on government known as the *Covenant of Ardashir* was translated by an unknown translator, while Ibn al-Muqaffa' had translated the *Letter of Tansar*. These translations were made for the benefit of the Umayyad caliphs.

Ibn al-Muqaffa; was a *zindiq*, namely a follower of the Manichaean religion and he wrote treatises on this religion. He converted to Islam in the last years of his life during the Abbasid period on the request of 'Isa ibn 'Ali for whom he served as his secretary.

When the caliph al-Mansur wished to build the city of Baghdad, in 762 CE, he selected three astrologers and charged them with casting the horoscope for the future city. [38] The horoscope itself is preserved in the *Chronology* of Biruni and in several other sources. Most sources agree that the astrologers who were assigned that task included Nawbakht the Persian (679-777) who became the ancestor of the Nawbakht family of astrologers, which served caliphs for a whole century, Ibrahim al-Fazari (d. 777), and Masha'allah al-Farisi. Ibrahim al-Fazari was obviously an Arab from the tribe of Fazara. Al-Biruni states explicitly that it was al-Nawbakht who determined the day for the foundation of the city to coincide with the propitious 23rd of July of that year.

We may ask: where did these three astrologers acquire the kind of advanced astronomical knowledge that they would have needed for casting such a horoscope at that early time of Abbasid in power?

Another scientist was Ya'qub ibn Tariq who was a collaborator of al-Fazari, and we may also ask where did Ibn Tariq learn his own astronomy so that he could produce, together with Fazari, a translation of the Sanskrit *Sidhanta* (al-Sindhind), which was completed during the caliphate of al-Mansur (754–775 CE). Later sources always joined those two names together, so it is sometimes difficult to determine who did what.

All these astrologers may have learned their craft in Persia during the Umayyad caliphate. But the sources are silent on that, and we do not know much about the Persian astronomy of the time beyond the existence of the *Shariyar zij*. Furthermore, the historical sources report that al-Fazari and/or Ibn Tariq wrote a theoretical astronomical work called *Tarkib al-aflak*, which seems to have been lost.

The same Fazari is also credited with the authorship of his own zij, in which he used the “Arab years” ('ala sinmy al-'Arab). Writing a theoretical astronomical text, transferring a zij to a different calendar, and producing astronomical instruments such as astrolabes -as we are also told about these men - could not have been done by amateur astronomers. Who educated al-Fazari and Ibn Tariq in all these fields of astronomy? And even if we believe that the three astrologers also used the Persian Zij-i Shahriyar for the purposes of the horoscope, we should also ask about another Arab, 'Ali ibn Ziyad al-Tamimi, from the tribe of Tamim, who was supposed to have translated this zij into Arabic. Who taught al-Tamimi how to translate a zij, and when he did so did he also transfer it into Arab years (as we are told that al-Fazari had done)?

All this evidence indicates that there was a class of people, who were already in place by the time the Abbasids took over from the Umayyad dynasty, who were competent enough to use sophisticated astronomical instruments, to cast horoscopes, to translate difficult astronomical texts, and to transfer their basic calenderical parameters, as well as to compose theoretical astronomical texts such as Tarkib al-aflak. Such activities could not have been accomplished by people who were just learning how to translate under the earliest Abbasids, as the classical narrative claims.[39]

We may mention here Jurjis, the father of Bukhtishu II and grandfather of Jibril ibn Bukhtishu, who was a scientific writer and was the director of the hospital in Jundishapur, which supplied physicians to courts in Iraq, Syria, and Persia. Due to his medical renown, he was called to Baghdad in 765 CE to treat the Caliph al-Mansur. After successfully curing the caliph, he was asked to remain in attendance in Baghdad, which he did until he fell ill in 769 CE.[40] Members of the Bkhtishu' family served the Abbasid caliphs during the ninth and tenth centuries.

Masawayh, also a physician in Jundishapur, during the 8th century, became the personal physician of Harun al-Rashid.

Theophilus al-Rahawi was the most eminent scholar among the Maronites. He was active under the Umayyads and was later the chief astronomer of the Abbasid Caliph, Al-Mahdi until his death in 783.

Al-Bitriq lived during the caliphate of al-Mansur (754-775), who commissioned him to translate numerous ancient medical and astrological works. One of his translated works is the Quadripartus of Ptolemeus, Kitab al-maqalat al-arba'a in astrology.

5- ALCHEMY AND PRINCE KHALID IBN YAZID

Alchemy, like medicine and astrology, was one of the sciences which received attention at an early date. According to Ibn al-Nadim, the Umayyad prince Khalid b. Yazid (d. 85 or 90/704 or 708) started the first translation movement in Islam. He ordered the translation of books on alchemy, medicine and astrology from Greek and Coptic into Arabic. The importance of Khalid, however, is due to his alchemical achievements. There are several alchemical treatises that are attributed to him[41].

Due to the doubts that were cast on Khalid and his work by Ruska and others, we shall investigate his identity in some detail.

Alchemy and its public image

The popularity of alchemy as a means of transmuting base metals into gold continued after the rise of Islam. Adepts of alchemy were already active at the time of the Prophet and under the Umayyad dynasty (661–750). We shall see presently that transmutation in alchemy had intrigued not only ordinary people but also Umayyad princes such as Khalid ibn Yazid and Abbasid caliphs such as Abu Ja'far al-Mansur. This enchantment with alchemy continued until the eighteenth century in Europe.

The background, education and culture of Khalid ibn Yazid

Mu'awiya ibn Abi Sufyan was appointed a ruler of Syria in 640 CE. He became caliph from 661 until 683. This means that he was a ruler in Damascus during 43 years. The civil administration in Damascus during this period was in Christian hands and there were naturally close relations between Muslims and Christians in the caliphate court.

Abu Sufian, Mu'awiya's father was one of the leaders of Quraysh. Mecca was a trading city in close relations with Byzantine Syria and its inhabitants were notbedouins.

Being raised in a family of merchants, and having spent most of his life in Damascus as a governor and later as a caliph, Mu'awiya was a man of culture. He was fond of history. It is reported that after he had awakened, he sat up and had archives brought to him with the lives of kings, their history, their wars, and their schemes. Special pages, who were entrusted with the keeping and reading of these records, used to read to him. So Mu'awiyah listened every night to several passages of history, of biography, of annals, and of political fragments.

These archives and records were kept in the caliphate palace and constituted a real library, which became a flourishing one along Alexandrian lines. Yusuf al-'Ishsh maintains that the first Bait al-Hikma was founded by Mu'awiya. [42]

Yazid I, Mu'awiya's son, was educated under eminent Muslim scholars. One of these was 'Ubayd ibn Sharya al-Jurhami (d 67/686) author of Kitab al-amthal and Kitab al-muluk. Another scholar was Daghfal ibn Hanzala al-Sandusi al-Shibani (d. 65/684) who was an expert in genealogy and had written Kitab al-tashjir on this subject. He was also versed in Arabic literature and in astronomy.

It seems that Mu'awiya saw in Daghfal's scholarship what is required for the education of Yazid, his son. He asked Daghfal to go and teach Yazid genealogy, astronomy and Arabic literature. The scholarship of these two men was reflected on Yazid so that he was considered one of the noted Arab orators and of their learned men. He was a man of culture and a noted poet who left beautiful verses that are still remembered and cited. He was also an engineer.[43]

Yazid had led the first campaign against the Byzantines in 52/672 in which several companions of the prophet including Abu Ayyub al-Ansari, had participated.

Controversy surrounds the biography of Yazid because he was involved in the tragic wars against al-Husain ibn 'Ali ibn Abi Talib, and Abd allah ibn al-Zubair. Both of these men claimed the right to become caliphs after Mu'awiya I, and refused to acknowledge Yazid as a caliph. The tragic defeat and murder of al-Husain resulted in deepening the rift between Shi'i and Sunni Islam, and the biography of Yazid I had been affected as a result. Yazid had no choice in waging these wars since both contenders wanted to depose him from his position as a caliph.

Yazid, was first married to Umm Hisham bint Utba bin Rabiya in 660 and had two sons, Muawiya and Khalid, by her. He loved Khalid more, and was called Abu Khalid, but he made Muawiya, the elder of the two, his successor.

Mu'awiya II was born on the 28th March 661, on the day when Mu'awiya I became a caliph. Khalid must have been born two or three years later.

Mu'awiya II was the first prince of the Ummayyads to grow up entirely at the court of the Caliph.. He was given private scholars and teachers. Khalid grew up with his brother and had received the same education.

When Mu'awiya II the brother of Khalid ibn Yazid died at about 22 years of age, Khalid was about 20 years. Mu'awiya II did not nominate a successor.

The personality of Khalid ibn Yazid according to Arab historians

Historic and other Arabic sources give accounts full of praise and appreciation for Khalid. Due to limitation of space we shall give only the account of Yaqut al-Hamawi in Kitab mu'jam al-udaba', (Dictionary of Men of Letters) [44]. Al-Hamawi writes:

"Khalid ibn Yazid ibn Mu'awiya ibn abi Sufian; the Prince Abu Hashim al-Umawi:

He was one the men of Quraysh who were distinguished by eloquence, kindness and courage. He was a great scientist, expert in medicine and alchemy, as well as a poet.

Al-Zubayr ibn Mus'ab had said: Khalid ibn Yazid ibn Mu'awiya was known as a scientist, a sage and a poet.

Ibn Abi Hatim said: that Khalid was one of second generation of the Syrian followers of the Prophet (al-tabi'un). He learned the Prophet's Hadith from his father and from Dahya ibn Khalifa al-Kalbi , may God be pleased with him.

Several later scholars quoted Khalid on the Hadith (the sayings of the Prophet). These include al-Zuhri, al-Bayhaqi, al-Khatib al-Baghdadi, al-'Askari and al-al-Hafiz ibn 'Asakir. Khalid was pious and he used to fast three days in the week, Friday, Saturday and Sunday. He used to say that he devoted his attention to books. H was charitable and he was greatly praised.

He was brave and daring, and there were debates between him and between 'Abd al-Malik ibn Marwan.

Khalid ibn Yazid died in 90 H, some say that he died in 85 H. He was attended on his death by Al-Walid ibn 'Abd al-Malik who said in his eulogy: let the Umayyads shed garments on Khalid, because they will never mourn any one like him."

Khalid ibn Yazid and his translation activity according to early Arab historians

The first translation of Greek science into Arabic was initiated by the Umayyad prince Khalid ibn Yazid. This is reported by dependable Arabic sources that were close in time to Khalid. One should have faith in the authenticity and reliability of the Arabic original sources instead of accepting the assumptions and conjectures of historian of the twentieth century about Khalid, especially since we have disproved such assumptions on concrete evidence.[45]

Some Arab authorities assume that the failure of Khalid to become a caliph was behind his devotion to science and to the translation of scientific works unto Arabic. About this Ibn al-Nadim says:

"Khalid ibn Yazid ibn Mu'awiyah was called the 'Wise Man of the Family of Marwan'. He was inherently virtuous, with an interest in and fondness for the sciences. As the Art [alchemy] attracted his attention, he ordered a group of Greek philosophers who were living in Egypt to come to him. Because he was concerned with literary Arabic, he commanded them to translate books about the Art from the Greek and Coptic languages into Arabic. This was the first translation in Islam from one language into another." [46]

At that time the ruler of Egypt was 'Abd al-Aziz ibn Marwan ,the brother of the Caliph Abd al-Malik. Abd al-Aziz governed Egypt from 685 to 704, and he possibly enabled Khalid to achieve his purpose.

Jabir Ibn Hayyan reported in Kitab al-rahib how Khalid summoned Maryanus to teach him 'ilm al-san'a.

Al-Jahiz (c. 776–868) reported in Kitab al-bayan wa al-tabyin that Khalid Ibn Yazid was an orator and poet, eloquent, comprehensive, of sound judgment and extremely well-mannered, and the first (in Islam) to order the translation of works on astrology, medicine and alchemy. [47]

Al-Baladhuri (d. 279/892) reported also about the involvement of Khalid in 'ilm al-san'a. [48]

Abu-l-Faraj al-Isbahānī (897-967) mentioned in Kitāb al-aghānī that Khalid wasted his time in the pursuit of alchemy.[49] In al-Aghani we find also an important testimony about Khalid given by al-Abu'l-Hasan al-Mada'ini (d. 830) who attributed it to one of Khalid's contemporaries.[50]

Al-Mas'udi (d. 345/956) mentioned in Kitab muruj al-dhahab that Khalid occupied himself with alchemy and he quoted three verses from a poem of Khalid on alchemy.

Ibn Khallikan (d. 1282 A.D.) praises Khalid's scientific skill and knowledge, which are exemplified by the quality of his writings. This author also tells us that Khalid studied alchemy with a Greek monk named Marianos. [51]

Khalid occupies a high standing among Arabic scientists and alchemists. Al-Biruni (d, 440/1048) described Khalid as the first Muslim philosopher.[52]

Most Arabic works on alchemy give citations from his writings and poems on 'ilm al san'a (the Art).

Khalid ibn Yazid and the Caliph Abu Ja'far al-Mansur- similar addiction to alchemy

Khalid was an Umayyad prince and a grandson of Mu'awiya the founder of the dynasty. When his brother Mu'awiya II died in 683 CE he was not elected to be a caliph because of his young age. Having been relieved from the concerns of the caliphate, he turned his attention to the pursuit of high culture. Alchemy and astrology were pursued by rulers and dignitaries throughout history. In Europe the fascination of rulers and the upper classes with these pursuits lasted until the eighteenth century. At Khalid's time alchemy and astrology, beside medicine, had the same importance. Ibn al-Nadim gave the motives of Khalid in pursuing alchemy as follows: "He was a generous man, for when someone said to him, 'You have expended most of your energy in seeking the Art,' Khalid replied, 'In so doing I have sought only to enrich my friends and brothers. I coveted the caliphate, but was unsuccessful.' Now I have no alternative other than attaining the culmination of this Art, so that anyone who one day has known me, or whom I have known, will not be obliged to stand at the gate of the sultan, petitioning or afraid."

About one century after Khalid, the Caliph al-Mansur pursued alchemy for the same motives. He was also seeking wealth for the benefit of the caliphate

Because of Khalid's obsession with alchemy, he initiated the translation movement in the sciences during the Umayyad Caliphate., and he left some important works. However, al-Mansur may have ordered some translations in alchemy also, but during his time there were already some Arabic translations available. Khalid sought to master the "Art" himself because he had all the time needed, and during his search for adepts who can teach him the "Art" he encountered several charlatans. However, al-Mansur as a caliph sought the help of all the available alchemists, who proved, no doubt, to be charlatans also.

Modern historians, who were influenced by their own ideology, accepted what is reported about al-Mansur's interest in alchemy despite the scanty evidence, but they considered the interest of Khalid in alchemy as legendary or fabricated, despite the overwhelming historical evidence that support his scientific activity.

We have purposely compared Khalid with al-Mansur because Khalid had all the qualifications needed in a patron of science and in becoming a scientist, while al-Mansur was a caliph fully occupied in caliphate affairs and alchemy for him was a temporary activity which had soon exhausted itself.

Stories of charlatans in alchemy at the time of Khalid and the Caliph al-Mansur

Imposters in alchemy were active since the elixir and transmutation became common knowledge. We have few stories that were reported by historians.

The first story took place during the life time of Khalid. The Caliph 'Abd al-Malik ibn Marwan (r. +685 to +705) appointed his brother Bishr ibn Marwan as Governor of Basra, with Musa ibn Nusair as his principal adviser. Now Bishr was fond of pleasure and handed over the conduct of all affairs to Musa. While thus withdrawn from business: "One of the men of Iraq came before him, and said: 'In God's name, is it your wish that I give you a drink which will cause you never to grow old, subject to certain conditions which I shall lay upon you?' What are these conditions? asked Bishr. 'That you do not allow yourself to be angry, do not mount a horse, and have no dealings with women, nor yet take any bath, for forty (days and) nights.' Bishr accepted these conditions, and drank what was given to him, shutting himself up from all men, near and far, and remaining secluded in his palace. And so, he continued till news suddenly reached him that he had been given the Governorship of Kufa, as well as of Basra. At this, his joy and delight could not be contained. He called for a horse to go to Kufa, but the same man appeared and urged him not to set forth, and not to stir by the least movement from his place. But Bishr would not listen to him. When the man saw his determination, he said: 'Bear me witness against yourself that you have disobeyed me!' And Bishr did so, testifying that the man was free of blame.

Then he rode out to Kufa, but he had not gone many miles when, having placed his hand upon his beard, lo! it fell away in his hand Seeing this he turned back to Basra, but remained there not many days until he died." [53]

The second story relates to how al-Mansur became attached to alchemy. In a report preserved in Ibn al-Faqih al-Hamadani's *Akhbar al-Buldan*, a work on cultural geography compiled in Baghdad around 200/903, 'Umara ibn Hamza, al-Mansur's secretary, is said to have returned to Baghdad after a lengthy stay in Constantinople at the court of Constantine V (r. 741-75) and to have reported to the caliph how the Byzantine Emperor had transmuted by means of a dry powder (elixir) lead and copper into silver and gold in his presence. Umara concluded his report with the words: "This was the reason that induced him (al-Mansur) to become interested in alchemy". . Al-Mansur must have become quickly disillusioned with the potential of alchemy to provide funds for the state treasury. But he may have unwittingly provided royal precedent for preoccupation with this "art".[54]

The third story involved the Caliph al-Mansur also and is reported in Syriac religious literature. [55] The patriarch Joannes died. " And then Abu Ja`far, also called 'Abd Allah, the caliph, gave orders to the bishops and compelled them to institute as patriarch Isaac, bishop of Karrhai

Isaac had become a friend of the caliph owing to the following cause. It is said that, when he was living on the hills of Edessa in a monastery, a certain monk came to him and lodged with him and was entertained by Isaac. And, when he wished to go, the stranger told Isaac to bring him a piece of lead; and, having melted it, he took from his mantle a little wallet, which contained an elixir, and he poured some of it on to the lead, and it changed its colour and became gold. And, when Isaac saw it, he was obsessed with longing to know the Art, and he earnestly begged him to teach it to him. And the monk kept saying that he did not know anything about this, but the elixir had been given him by someone else. And when he started to go on his way, Isaac went, with him to escort him: and, as they were going along, he struck him and threw him into one of the old wells, and cast a great stone after him and killed him. And this he did because he thought that he had a large quantity of the elixir with him. And upon searching his mantle he found nothing in it except the wallet. And owing to this elixir he gained the favour of Abu Ja`far the caliph; and for this reason after the death of Ioannes the caliph assembled the bishops and forced them to make him patriarch under compulsion; and they instituted him in Rhesaina (Ra's al-'ain). Isaac promised the king that he would go out and collect roots useful for the Art and teach it to him. And after a short time the king sent after him and discussed it with him and discovered that he was a liar and did not know it and was deliberately deceiving him, so he gave orders and they strangled him and threw his body into the Euphrates.[56]

Arabic alchemical treatises of pre-Islamic pseudo authors

We find in the writings of early Arabic alchemists many quotations attributed to pre-Islamic persons and there are several Arabic alchemical treatises attributed to them. These works were the subject of research by historians of science who concluded that most of these works were attributed to pseudo authors. These pseudo authors included Hermes, Iflatun (Plato), Aristo (Aristotle), Pythagoras, Agathodaimon, Ostanos, Hiraql (Heraklius, Byzantine emperor, 610–41), Cleopatra, Mary, Zosimos, Isis, Krates, Markos, Jamasp, Furfuriyus and many others. They came from Egypt, Syria, Mesopotamia, Persia, Greece and Asia Minor. Sezgin gave a list of the Arabic treatises attributed to each of these pseudo authors. The diversity and scope of these works leave no doubt that they were written before Islam and were translated into Arabic from Greek or Syriac.[57] Sezgin and others are of this opinion. Other historians are of the opinion that these works were written by pseudo-Arabic authors after Islam [58] This assumption seems flawed because it is extremely improbable that such comprehensive and vast collection of authors and intricate alchemical ideas could have been invented by early pseudo-Arabic authors.

Most of the Greek writings on alchemy were written in Alexandria, but were subsequently lost or destroyed, and the surviving writings that have come down through the years were preserved in Arabic translations only.

The crucial question is where and when the Arabic translations were made. There are different explanations. One of them says that much of the literature and learning of Alexandria was preserved by Syrian scholars who took refuge in Persia and there translated into Syriac a number of Greek works on alchemy. Some of these works were translated again into Arabic.[59]

The other explanation says that there are Syriac works preserved by the Christian Syriac schools of northern Syria, either translated from Greek or authored by Syriac scholars. Some of these works were on alchemy, astrology, the interpretation of dreams and various forms of divination.[60]

Some of the Syriac alchemical treatises are now in the libraries of Europe. They are nearly all earlier than the 7th century, and most appear to belong to the 3rd and 4th centuries; some are the work of authentic authors like Zosimus and Synesius, while for others, such as profess to be written by Moses, Democritus, Ostanos, &c., the authorship is clearly fictitious. Some of the same names and the same

works can be identified in the lists of the Kitab-al-Fihrist. Examples of such translations are preserved in MSS. at the British Museum, partly written in Syriac, partly in Arabic with Syriac characters. The Syriac portions represent a compilation of receipts and processes. They include the earlier translations made by Sergius of Resaena in the 6th century. They contain, under the title Doctrine of Democritus, a fairly methodical treatise in ten books comprising the Argyropoeia and Chrysopoeia of the pseudo-Democritus, with many receipts for colouring metals and making artificial precious stones. They give illustrations of the apparatus employed, and their close relationship to the Greek is attested by the frequent occurrence of Greek words and the fact that the signs and symbols of the Greek alchemists appear almost unchanged. Another Syriac MS., in the library of Cambridge University, contains a translation of a work by Zosimus which is so far unknown in the original Greek. Berthelot gives reproductions of the British Museum MSS. in vol. ii. of *La Chimie au Moyen Age*.

After Arabic became the official language of the Empire and the universal language of culture, Syriac scholars started translating some of these works into Arabic.

The third source of alchemical treatises is from Harran. Some scholars (Stapleton) have suggested that Arabic alchemy descended from Harran in Syria. This city seems to have been a fountainhead of alchemical notions. And it is possible that the distillation ideology and its spokeswoman, Maria as well as Agathodaimon, represented the alchemy of Harran, which presumably migrated to Alexandria and was incorporated into the alchemy of Zosimos.

During the 8th and 9th century Harran was a centre for translating works of astronomy, philosophy, alchemy, astrology and medicine from Greek to Syriac and thence to Arabic, bringing the knowledge of the classical world to the emerging Arabic-speaking civilization in the south.

A fourth translation movement from Greek directly is the historic achievement of Khalid ibn Yazid in Damascus, as we have mentioned above. Some of the works that were translated for Khalid are known but the majority are still unknown.

Several alchemical treatises, written in Arabic, exist in manuscripts in the National Library at Paris and in the library of the University of Leiden, and have been reproduced by Berthelot, with translations, in vol. iii. of *La Chimie au moyen age*. Some are largely composed of compilations from Greek sources. The most interesting and possibly the oldest is the Book of Crates; it is remarkable for containing some of the signs used for the metals by the Greek alchemists, and for giving figures of four pieces of apparatus which closely resemble those depicted in Greek MSS. Its concluding words suggest that its translation was due to "Khalid ibn Yazid".

A fifth possible translation activity in alchemy is that al-Mansur who became fascinated with alchemy. He may have arranged for alchemical texts to be translated for him.[61] However, at al-Mansur's time there existed already numerous alchemical texts in Arabic which manifestly date from pre-Abbasid times.

All the above mentioned avenues and centres of translation of alchemical works explain the existence of the numerous alchemical works in Arabic by pre-Islamic pseudo-authors.

Epilogue

The cultural history of the Umayyads is not sufficiently researched. Sometimes it is deformed. One factor, according to some scholars, is the tendency of the Abbasids to suppress the true history of the Umayyads.[62] These scholars say that all Arabic histories appeared in the Abbasid era and were

written by historians that were in the service of the Abbasids. We know that the Abbasids did all in their power to blot out the memory of the Umayyads, and when that failed, to falsify their memory. Accordingly, writers of that period, seldom attribute any virtue to the members of the previous dynasty. Others attribute the injustice to the Umayyads to be due to the schism between Shi'i and Sunni Islam, especially after the martyrdom of al-Husain.

This essay shows that the cultural achievements of the Umayyads were phenomenal. They established the Arab-Muslim Empire. They started the sciences of the Arabic language and the sciences of the Muslim religion. They arabized the administration and established Arabic as an international language. They arabized the gold dinar and the silver dirham. They initiated the translation movement from other languages into Arabic. They pioneered Islamic architecture and city planning, and their achievements in technology were without equal.

Khalid ibn Yazid ibn Mu'awiya was given an education of a prince fit for a caliph. He was a sage, pious, virtuous, brave and generous. He devoted his life to science after the caliphate had escaped him, and he initiated the translation movement in Islam.

The Great Mosque of Cordoba

Known locally as Mezquita-Catedral, the Great Mosque of Cordoba is one of the oldest structures still standing from the time Muslims ruled Al-Andalus (Muslim Iberia including most of Spain, Portugal, and a small section of Southern France) in the late 8th century. Cordoba is a two hour train ride south of Madrid, and draws visitors from all over the world.

Temple/Church/Mosque/Church

The buildings on this site are as complex as the extraordinarily rich history they illustrate. Historians believe that there had first been a temple to the Roman god, Janus, on this site. The temple was converted into a church by invading Visigoths who seized Cordoba in 572. Next, the church was converted into a mosque and then completely rebuilt by the descendants of the exiled Umayyads—the first Islamic dynasty who had originally ruled from their capital Damascus (in present-day Syria) from 661 until 750.

A New Capital

Following the overthrow of his family (the Umayyads) in Damascus by the incoming Abbasids, Prince Abd al-Rahman I escaped to southern Spain. Once there, he established control over almost all of the Iberian Peninsula and attempted to recreate the grandeur of Damascus in his new capital, Cordoba. He sponsored elaborate building programs, promoted agriculture, and even imported fruit trees and other plants from his former home. Orange trees still stand in the courtyard of the Mosque of Cordoba, a beautiful, if bittersweet reminder of the Umayyad exile.

The Hypostyle Hall

The building itself was expanded over two hundred years. It is comprised of a large hypostyle prayer hall (hypostyle means, filled with columns), a courtyard with a fountain in the middle, an orange grove, a covered walkway circling the courtyard, and a minaret (a tower used to call the faithful to prayer) that is now encased in a squared, tapered bell tower. The expansive prayer hall seems magnified by its repeated geometry. It is built with recycled ancient Roman columns from which sprout a striking combination of two-tiered, symmetrical arches, formed of stone and red brick.

The Mihrab

The focal point in the prayer hall is the famous horseshoe arched mihrab or prayer niche. A mihrab is used in a mosque to identify the wall that faces Mecca—the birth place of Islam in what is now Saudi Arabia. This is practical as Muslims face toward Mecca during their daily prayers. The mihrab in the Great Mosque of Cordoba is framed by an exquisitely decorated arch behind which is an unusually large space, the size of a small room. Gold tesserae (small pieces of glass with gold and color backing) create a dazzling combination of dark blues, reddish browns, yellows and golds that form intricate calligraphic bands and vegetal motifs that adorn the arch.

The Horseshoe Arch

The horseshoe-style arch was common in the architecture of the Visigoths, the people that ruled this area after the Roman empire collapsed and before the Umayyads arrived. The horseshoe arch eventually spread across North Africa from Morocco to Egypt and is an easily identified characteristic of Western Islamic architecture (though there are some early examples in the East as well).

The Dome

Above the mihrab, is an equally dazzling dome. It is built of crisscrossing ribs that create pointed arches all lavishly covered with gold mosaic in a radial pattern. This astonishing building technique anticipates later Gothic rib vaulting, though on a more modest scale.

The Great Mosque of Cordoba is a prime example of the Muslim world's ability to brilliantly develop architectural styles based on pre-existing regional traditions. Here is an extraordinary combination of the familiar and the innovative, a formal stylistic vocabulary that can be recognized as “Islamic” even today.