

Lesson N°04

Middle Ages: occident and orient (Muslim civilization)

I. Definition of the Middle Ages :

This is a period extending over almost a thousand years, between the capture of Rome by the Barbarians (5th century) and the capture of Constantinople by the Turks (1453: capture of Constantinople, capital of the Byzantine Empire, by the Ottomans).

⇒ The term Middle Ages (considered pejorative) is often replaced by Medieval.

II. Biology in the Middle Ages

A. In the Orient

Islam was born in the 7th century BC. Within a century, Muslims had annexed territories from Spain to China and the Philippines. The Middle Ages saw the apogee of Islamic civilization: many Arab savants left an important contribution to biology and medicine. Scientists in the Muslim empire included:

1. **Astronomy : Muhammad ben Geber (Djefar) al-Battani**, an Arab astronomer born in Baten (hence his name) in Mesopotamia.
2. **Geography : Al Edrisi**, drew a large map of the world oriented south and divided into seven "climates" in latitude and ten sections in longitude.
3. **Optics : Kamal al-Din Abul-Hasan Muhammad Al-Farisi** was a Persian Muslim physicist, mathematician and savant.
4. **Mathematics : Al-Khwarizmi** in Baghdad, a Persian mathematician, geographer, astrologer and astronomer. Founder of algebra.
5. **Geometry** : The introduction of trigonometric functions is attributed to **Nasir ad-Din at-Tusi** , (Al-Khwarizmi)
6. **Chemistry : Jâber Ibn Hyyan**, a Muslim alchemist of Yemeni origin known for his treatises on alchemical subjects, in which he described processes such as crystallization, distillation, calcination, sublimation and evaporation.
7. **Medicine** :
 - ❖ **Avicenna (Ibn Sîna)**, father of modern medicine.
 - ❖ **Ibn Al Nafis**, described the process of blood circulation.
 - ❖ **Avenzoar (Ibn Zuhr)**, known for practice and experimentation.

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- ❖ **Rhazès (Abu Bakr Muhammad ibn Zakariya al-Razi)**, developed the clinical method, with clinical signs and symptomatology forming the basis of reasoning leading to diagnosis and therapy.
- ❖ **Averroès (Abu al-Walid ibn Ruchd)**, established an Analysis of Aristotle's metaphysics with regard to the teachings of the Koran.

B. In the Occident

In the West, the Middle Ages were characterized by :

- ⇒ Marked religious evolution (Christian conquest, apogee and decline of the Christian religion).
- ⇒ Dominant influence of the Church for 10 centuries.

In the 12th century, European savants travel to Andalusia and study Arabic to translate scientific texts. Beginning of translations from Arabic into Latin:

- ⇒ Juan of Seville
- ⇒ Gérard de Crémone: Rhazès and Avicenna's Canon
- ⇒ Domingo Gonsalvez
- ⇒ Constantine the African

The rare authors who have contributed to Biology are :

- ❖ **Albert the Great or Albertus Magnus** : the comparative anatomy of man and animals.
- ❖ **Frederick II of Hohenstaufen** : the dissection of human cadavers