Lecture #23

**Al-Razi**, **Ibn Rushd**, **Al-Biruni**, and **Al-Farabi**

**1. Al-Razi (Rhazes) (864–930 C.E.)**

* **Birthplace**: Ray, Iran.
* **Fields of Contribution**: Medicine, Chemistry, Mathematics, Astronomy, Philosophy.
* **Key Achievements**:
  + **Medicine**:
    - Authored renowned works such as **Kitab al-Mansoori**, **Al-Hawi**, **Kitab al-Mulooki**, and **Kitab al-Judari**.
    - **Kitab al-Mansoori**: A 10-volume book translated into Latin in the 15th century, extensively covering Greco-Arab medicine.
    - Distinguished between **smallpox and chickenpox**, a groundbreaking medical achievement.
    - Advocated for cures using **regulated food** and **psychological treatment**.
    - First to use **opium for anesthesia** in surgery.
  + **Chemistry**:
    - Authored **Kitab al-Asrar**, which detailed the preparation of chemical materials and their uses.
    - Pioneered the production of **sulphuric acid**.
    - Developed **alcohol** by fermenting sweet substances.
    - Designed instruments for chemical investigations.
  + **Philosophy**:
    - Contributed significantly to philosophical discourse alongside his scientific endeavors.
  + **Legacy**:
    - Credited with over **200 scientific contributions**, half of which focus on medicine and 21 on alchemy.

**2. Ibn Rushd (Averroes) (1128–1198 C.E.)**

* **Birthplace**: Cordova, Andalusia (modern-day Spain).
* **Fields of Contribution**: Philosophy, Medicine, Jurisprudence, Logic, Astronomy.
* **Key Achievements**:
  + **Medicine**:
    - Authored **Kitab al-Kulyat fi al-Tibb** (translated into Latin as "Colliget"), which discussed the diagnosis, prevention, and cure of diseases.
    - Wrote 20 medical books, earning recognition as a distinguished physician.
  + **Philosophy**:
    - Authored **Tuhafut al-Tuhafut** (Incoherence of the Incoherence) in response to Imam Ghazali's work, defending philosophy.
    - His writings explained and analyzed the works of Aristotle, leading to the latter's recognition in Europe.
  + **Jurisprudence**:
    - Authored **Hidayat-al-Mujtahid wa-Nihayat-al-Muqtasid**, considered a seminal work on the Maliki school of thought.
  + **Astronomy**:
    - Wrote a treatise on the **motion of celestial spheres** (**Kitab fi-Harakat al-Falak**).
  + **Legacy**:
    - His writings covered **20,000 pages**, and many were translated into various languages, spreading his influence globally.

**3. Al-Biruni (973–1048 C.E.)**

* **Birthplace**: Khwarazm (modern-day Uzbekistan).
* **Fields of Contribution**: Physics, Metaphysics, Mathematics, Geography, Sociology, Astronomy, History.
* **Key Achievements**:
  + **Astronomy and Mathematics**:
    - Authored **Qanoon-i-Masoodi**, detailing theories on astronomy, trigonometry, and planetary motions.
    - Conducted experiments on astronomical phenomena, accurately measuring longitudes and latitudes.
    - Discussed the **rotation of the Earth** and proposed correct values for various geographical locations.
    - Discovered that the **speed of light** is far greater than the speed of sound.
  + **Medicine**:
    - Combined Arabic and Indian medical knowledge in **Kitab al-Saidana**.
  + **Geography and History**:
    - Authored **Kitab al-Hind**, which provided a detailed account of the Indian subcontinent's historical and social conditions.
    - Discussed the ancient history of nations in **Al-Athar al-Baqia**.
  + **Physics**:
    - Discovered formulas related to **specific gravity** and other physical phenomena.
    - Demonstrated that the formula attributed to Newton was discovered by him centuries earlier.
  + **Legacy**:
    - Renowned for his versatility and scientific rigor, Al-Biruni is considered one of the greatest scholars of the Islamic Golden Age.

**4. Al-Farabi (870–950 C.E.)**

* **Birthplace**: Wasij, near Farab, Turkistan.
* **Fields of Contribution**: Philosophy, Logic, Sociology, Psychology, Medicine, Mathematics, Music.
* **Key Achievements**:
  + **Philosophy**:
    - Known as the “**Second Teacher**” (Al-Muallam al-Thani), second only to Aristotle in philosophical contributions.
    - Simplified the study of logic by dividing it into **Takhayyul (idea)** and **Sabut (proof)**.
  + **Sociology and Politics**:
    - Authored **Ara Ahl al-Madina al-Fadila** ("The Virtuous City"), which outlined an ideal society based on justice and morality.
  + **Music**:
    - Contributed to the development of music theory and its relationship to mathematics and psychology.
  + **Science and Medicine**:
    - Authored numerous books on logic, psychology, and medicine, showcasing original contributions.
  + **Legacy**:
    - A prolific writer and encyclopedist, Al-Farabi's works influenced both the Islamic world and Europe, earning him a place among history’s greatest thinkers.