



MUSLIM SCIENTISTS AND THEIR CONTRIBUTIONS

A Very Brief Booklet.

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MUSLIM SCIENTISTS AND THEIR CONTRIBUTIONS IN THE DEVELOPMENT OF SCIENCE

1-MUHAMMAD BIN MUSA AL-KHAWARIZMI

Introduction

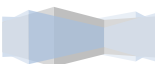
- Popularly known as AL-KHAWARIZMI
- Born in Khawarizm in A.D. (780-847)
- Great mathematician, astronomer, historian, geographer and musician

Major contributions

- First person who used zero
- Considered as an authority in mathematics
- Composed oldest works on algebra and astronomical tables
- Systematized the Greek and Hindu mathematical knowledge
- Wrote famous book named **Hisab-al-jabar wal Muqabla** in which he gave analytical solutions of quadratic and linear equations
- This book was used as principal mathematical textbook, until the 16th century by European universities.
- “The principal figure” in the early history of Arabic mathematics
- Introduced the method of counting based on numerals and decimal systems for the first time
- **Kitab-surat-al-ard** was a geography book in which he gave an idea about the shape of the earth
- **Kitab-al-tariq** was his book on history
- Composed his own astronomical tables known as Zijj (ZJ), which became a model for astronomical pursuits in East and West.

Books

- Hisab Al Hindi
- Al Jama Wat Tafri
- Kitab Surat Al Ard
- Kitab al Tariq



2-Jabir Ibn Hayyan

Introduction

- Popularly known as GEBER in the West
- Born in A.D. (721-815)
- Known as a legendary figure in the field of Chemistry
- God-Father of modern chemistry

Major contributions

- Prepared large number of important chemicals like NITRIC ACID, HYDROCHLORIC ACID, SULPHURIC ACID, WHITE LEAD etc.
- Introduced new chemical techniques and processes like Calcination, Reduction, Sublimation, Distillation, Melting, Crystallization etc.
- Gave a sound theory on Geological formation of metals.
- Prepared basic lead, arsenic, antimony and carbonate from their sulphides.
- He dealt with refinement of metals, preparation of steel, dyeing of cloth and leather.

BOOKS

- Book of seventy
- Composition of AL-CHEMY
- Kitab al Tajmi
- Kitab al Rahmah

3-Zakariya- al- Razi

Introduction

- Abu Bakr Muhammad Ibn Zakariya Al-Razi
- Born in A.D. (865-925) at RAYY
- Better known as Rhazes in the West
- Persian muslim
- Was great PHYSICIAN of Islamic world
- Most brilliant pillar of Islamic medicine along with Ibn-Sina
- His major fields of interest were Physics, medicine, chemistry, philosophy etc



Major Contributions

- AL-HAWI is a most monumental work of him. It is the most comprehensive encyclopedia of medicine in 20 volumes.
- Earned the title of “FATHER OF PAEDIATRICS” by writing his monograph on “Diseases in Children”.
- Was the first person who recognized the reaction of pupil to the light.
- Was the first person who used animal gut as ligature for surgical operations
- Was the first person who used Opium as anesthetic during surgery
- Was the first to classify substances into vegetables, animals and minerals.
- Believed in five eternal principals in metaphysics namely 1)creatot 2)soul 3)matter 4)time 5)space

Books

- Al-Judari Wal Hasbah (detail of small pox and measles disease)
- Kitab Al-Asrar (deals with classification of chemical substance and preparation of chemicals and their applications)
- Arabian medicine
- Kitab-al-mansuri
- Barr-ul-Saat

4-ABU ALI IBN-E-SINA

Introduction

- Abu Ali Hussain Ibn Abdullah Ibn Hasan Ibn Ali Ibn Sina
- He is better known as AVICENNA in the West.
- Born at Afsinah in A.D. (980-1037)
- The greatest intellectual giant of middle ages
- Unforgettable physician of all times
- Unparallel versatile genius

Major contributions

- Contributed to the medical science, philosophy, logic, mathematics, astronomy and music
- Wrote a famous book named “AL-QANNUN FIL TIB” in which he discussed human physiology and medicine.
- This book is known as CANON in Latin



- Was translated in many languages and it remained the sole textbook of medicine for several hundred years in western universities
- Consisting of approximately a million words, is the most influential textbook ever written
- He wrote no less than 230 books and treaties.
- Was the first to use “CATHETERS” made of the skins of various animals
- He mentioned “INTRAVESICAL INJECTIONS” by means of a silver syringe.
- He is considered as “FATHER OF GEOLOGY”
- He wrote books on interior of earth, mountains and gave scientific reasons for earthquakes.
- He fell victim to a disease in which he was a specialist

Books

- Al- Shifa
- An-Najat
- Nafia
- Isharrat

5-Ibn Al Haitham

Introduction

- Abu Ali Al Hasan Ibn Al-Haitham
- Known as ALHAZAN in the west
- Born at Basrah in A.D. (975-1039)
- Mathematician, physicist and optician

Major contributions

- He is more known for his optical works which were translated in Latin
- Explained the refraction of light rays through transparent objects
- Discovered magnifying lenses
- Function of retina as the seat of vision
- First scientist who elaborated two laws of Reflection of light
- Pinhole camera was constructed by him
- He was the first person who declared that LIGHT IS A FORM OF ENERGY.
- Identified Gravity as a force
- His fame lies in his book Kitab-al-manazir which is on optics.

Books

- On twilight phenomena
- Mizanul Hikma
- Configuration of the universe



6-Ibn Al-Baitar

Introduction

- Abu Muhammad Abdullah Ibn Ahmad Al-Baitar
- Born in Malaga (Spain) at the end of 12th century and died at Damascus in 1248 AD.
- Great Spanish muslim botanist and pharmacist

Major Contributions

- Classified and gave names of plants kingdom over which modern botany is based
- Gathered herbs and new plants from Spain to Syria and extracted medicines from them
- Laid foundation of herbal medicines
- His work was considered as authority in plants

Books

- Jami
- Kitab AL-Jami Fi Adwiya Al Mughani(20 chapters dealing with diseases of head, year, cosmetics and fever)
- Kitab AL-Jami Fi Adwiya Al Mufzada (encyclopedia in Botany in which 1400 medical drugs are described)

7-AI BIRUNI

Introduction

- Abu Rayhan Muhammad Al- Biruni
- Born in A.D. (973-1048) near Khawarizm
- He was a prolific writer and he never had a pen out of his hand

Major Contributions

- Explained the problems of advanced trigonometry
- Gave theory that light travels faster than sound
- Described and explained fully the concept of longitude and latitude
- He gave idea that earth is not stationary but rotate on its axis
- He learned Sanskrit language in order to investigate Indian knowledge
- He accurately determined the weight of 18 stones in physics

Books

- Tahqiq Al Hind (comprehensive account on history and social conditions of India in 11th century)
- Qanun Al Masudi
- Asrar AL Baqiya
- Kitab Al Saidana (explained different medicines)
- Kitab Al Jawahar (book of gems and stones of different types)



- AL Tafhim

8- IBN RUSHD

Introduction

- Abdul Waleed Muhammad Ibn Ahmed Ibn Muhammad Ibn Rushd
- Popularly known as AVERROES in the West
- Born at Cordova (Spain) in A.D. (1126-1198)
- He was an authority on FIQH

Major Contributions

- He contributed in different fields especially Islamic Jurisprudence.
- He investigated astronomy at length and discovered the sunspots.

Books

- Hidayat Al Mujtahid Wa Nihayat Al Muqtasid
- Kitab Fi Karkal AL Falak
- Tahafut AL Tahafut
- Kitab Fasl Al Maqal
- Kitab Al Lashf Al Manahij

9- Nasir-Ud-Din Toosi

Introduction

- Born in A.D. 1201 in Toosi (Iran)
- He contributed in many fields especially astrology, music, mineralogy and ethics
- Died in Baghdad in A.D. 1274.

Major contributions

- He built an observatory for astronomical researches at Maragha
- He was also an expert on mathematics and he earned great popularity by writing “ THE ILLKHANIAN TABLES” . This work is divided into four books:
 1. Chinese, Greek, Arabic and Persian Chronology
 2. Motions of the planets
 3. Ephermeride
 4. Astronomical observations

Books

- He wrote a treatise on a Quadrilateral, “ a work in which trigonometry, plane, and spherical” found its first methodically developed and deliberate expression.



- Kitab Al fusul
- Kitab Al tehsil
- Kitab Shaki Al Qatta
- Qawaid Al Handasa

10- Abu Ishaq Al Kindi

Introduction

- Born in Basrah in the beginning of 9th century AD.
- Popularly known as “Philosopher of the Arabs”
- Known as AL-KINDUS in the west
- He was a great physicist

Major contributions

- Contributed in the fields of music, meteorology, and optics.
- No less than 265 works are ascribed to him of which 15 are on meteorology, 8 on music and several on specific weights, tides and optics .
- Most important work was on reflection of light
- Discussed music from scientific point of view
- Worked on geometrical optics
- Explained the laws related to gravitational fall of the bodies

Books

- De Medicinnarum compositarium Gradibus (which deals with medicine)
- De Aspectibus (treatise on geometrical and physiological optics)

11-Al-Battani

Introduction

- Abu Abdullah Muhammad Ibn Jabir Al-Battani
- A great ARAB astronomer and mathematician
- Born around A.D. 858.
- Died in A.D. 929

Major Contributions

- Introduced the use of sines in mathematical calculations
- Widened the scientific horizons of astronomy beyond the Greek’s metaphysical concepts.
- Was an excellent observer of lunar and solar eclipses.
- Had a great command in trigonometry and he established the relation between the sides and angles of a spherical triangle



- Explained the phenomenon of EQUINOXES (either of two times in a year when the sun crosses the celestial equator; either of the two points at which the sun's path intersects with the celestial equator)
- Also prepared the Islamic lunar calendar.

BOOKS

- His famous book was KITAB AL-ZIG

12-UMMAR AL-KHAYYAM

Introduction

- Born in Nishapur in A.D. (1044-1123)
- Was mathematician, astronomer and philosopher

Major contributions

- Was the first person who proved BINOMIAL THEOREM
- Classified algebraic equations
- Introduced the Jalali calendar
- Determined accurate methods for determination of specific gravity
- Recognized 13 different forms of cubic equations and arranged them in their order of complexity

13-ABUL WAFI MUHAMMAD AL-BUZZJANI

Introduction

- Born in A.D. (940-988) in NISHAPUR, later on migrated to Baghdad in 959 AD.

Major contributions

- His major contribution was in mathematics
- Gave many solutions of trigonometry and geometry
- Gave knowledge on movements of the moon

14-ALI BIN RABBAN TABRI

Introduction

- Born in A.D. (775-870) in Tabaristan
- Was great scientist of his age

Major contributions

- Greatly contributed in the field of Zoology, Psychology, PHILOSOPHY as well as ASTRONOMY



- His famous book was FIRDOS UL HIKMA

15-ZIA UD-DIN AL DAMHRI

Introduction

- Was a greatest zoologist and greatly contributed in the field of zoology
- Wrote famous book namely HAYAT- AL- HAYWAN OR LIFE OF ANIMALS
- He also classified plants

16-AL-MAWARDI

Introduction

- Was born at BASRAH in A.D. (1058-1123)
- Was a learned jurisconsul and political economist.
- Expert on diverse subjects like religion, ethics, literature and politics.

BOOKS

- AL HAWI
- AL IQNA
- AL AHKAM US SULTANIYAH

17- Abdul Qasim Al- Zahrawi

Introduction

- Better known as “Mamoon of the West”
- Born in A.D. 936 in SPAIN

Major contributions

- Was a great Surgeon
- Invented many surgical appliances, never known before
- Was a physician as well.
- He was an excellent dentist also and he could very successfully set an artificial tooth in place of diseased.
- He gave perfection to the surgical science.
- He died in A.D. 1013.

Book

- AL-TASRIF



18- Dr Abdul Qadeer Khan

Introduction

- Greatest scientist and pioneer of PAKISTAN nuclear power
- Born on 1st April 1936 at Bhopal in India
- Received early education from India
- Went to HOLLAND for higher education and worked as a research assistant after MSC
- Received Phd degree from University of Leaven (Belgium)

Achievements

- Appointed as an expert in Urenco enrichment plant in Holland
- Laid the foundation of engineering lab at KAHUTA renamed as Abdul Qadeer Khan laboratories
- It was his efforts that Pakistan became Islamic nuclear power on 28th May 1998.

19- Dr Abdul Salam

Introduction

- Prominent scientist of Pakistan
- Born in Jhung in 1926
- Get higher education from England where he carried his research in theoretical physics

Achievements

- He gave the theory of “N” particles and unification of forces on which he awarded nobel prize in 1979.
- He established an institute on theoretical physics in TRIESTE (ITALY).
- Was died in 1997.

