HISTORY OF PHARMACY

THE ARAB SCHOOL

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HISTORICAL CONTEXT

The golden age of Arab science and the translation schools

The Islamic Golden Age (8th–13th Century)

• An empire of knowledge — The Arab-Muslim expansion created a vast empire stretching from India to Spain, gathering knowledge from multiple civilizations.

• Scientific patronage — The Abbasid caliphs, notably Harun al-Rashid and al-Ma'mun, generously funded scientific and medical research.

• Preservation and enrichment — A policy of tolerance preserved Greek, Persian, Indian, and Syriac knowledge, then enriched it with new discoveries.

• Baghdad, capital of knowledge — The city became the intellectual center of the medieval world, attracting scholars, physicians, and translators from across the globe.

• Pharmacy as science — Medicine and pharmacy became distinct disciplines, separate from magic and superstition.

Manuscript from the House of Wisdom, 13th century

The Translation Schools and the House of Wisdom

• Dār al-Ḥikma (House of Wisdom) — Founded in Baghdad in the 9th century under Caliph al-Ma'mun, it became the first research and translation center of the medieval world.

• Systematic translation — Scholars translated Greek works by Hippocrates, Galen, and Dioscorides, as well as Persian, Sanskrit, and Syriac texts.

• Ḥunayn ibn Isḥāq — The greatest translator in Arab history. He translated Dioscorides' De Materia Medica and created a rich and precise Arabic scientific terminology.

• Payment by weight in gold — Translators were paid by the weight of the books they translated, testifying to the value placed on knowledge.

• Lingua franca of science — The Arabic language became the repository and mediator of all medical and pharmaceutical sciences.

Arabic manuscript on the preparation of remedies

02

FOUNDATIONS OF ARAB PHARMACY

Chemistry, pharmaceutical techniques, and professional organization

Chemistry, Mother of Arab Pharmacy

• Al-kīmiyāʾ, foundation of pharmacy — Medieval Arab pharmacy is inseparable from chemistry. It enables improved dosages, isolation of active principles, and deep knowledge of matter.

• Jābir ibn Ḥayyān (Geber) — In the 8th century, he invented the alembic (al-anbīq) for distillation, allowing the isolation of active principles from medicinal plants.

• Al-Rāzī isolates alcohol — In the 10th century, Rhazes isolates alcohol (al-kuḥl) by distillation for the first time, opening the way to new pharmaceutical forms.

• Scientific classification — Substances are classified as solids, liquids, and gases; distinction between minerals, vegetables, and animals.

• From empirical science to experimental science — Chemistry transforms pharmacy from an empirical art into a discipline based on observation and repeatability.

Diagram of Jābir ibn Ḥayyān's alembic, 8th century

Technical Innovations and Pharmaceutical Forms

• Invention of syrup (al-shurub) — In the 8th century, Arab pharmacists invented syrup using cane sugar (al-sukkar), creating a galenic form that is easy to administer.

• Preparation techniques — Mastery of distillation, crystallization, sublimation, solution, reduction, and calcination.

• New galenic forms — Pills, elixirs, ointments, electuaries, tinctures, suppositories, inhalants, and confections.

• Floral waters and essential oils — Production of rose and orange waters by steam condensation, used as medicines and perfumes.

• Conservation and stability — Use of narrow albarelli to limit air contact, glass flasks for collyria, lead containers for fatty substances.

Preparation of medicines, Arabic manuscript, 1224 CE

The Profession of the Saydalānī (Pharmacist)

• An independent profession — Pharmacy (saydalah) became a profession distinct from medicine as early as the 9th century, four centuries before Europe.

• First pharmacies — Establishment of the first private pharmacies in Baghdad (754), then throughout the Muslim world from Córdoba to Samarkand.

• Public hospitals (bīmāristāns) — Each hospital had its own dispensary and large-scale manufacturing laboratory for syrups, ointments, and electuaries.

• Professional qualification — The saydalānī was a trained, qualified practitioner subject to strict professional standards.

• State control — Periodic inspection by a government official (al-muḥtasib) who verified weights, measures, and drug purity to protect the public.

First apothecary shops in the Muslim world

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GREAT FIGURES

Pioneers of Arab pharmacology and pharmacopoeia

Sabur ibn Sahl — The First Arab Pharmacopoeia

?–869 — Physician and pharmacist of the Abbasid court

- The Aqrabadhīn — His work al-Aqrabadhīn is the first structured Arab pharmacopoeia, classifying medicines according to their galenic forms.
- Classification by form — Tablets, powders, ointments, syrups, electuaries, and collyria: each form is described with its preparation methods.
- Practical guide — The work details pharmacological actions, dosages, and indications, designed as a field manual for saydalānīs.
- Lasting influence — His approach by pharmaceutical forms influences all subsequent treatises, from Rhazes to Avicenna.

Key Facts

Era: 9th century, Abbasid court

Work: al-Aqrabadhīn

Innovation: Classification by galenic forms

Target audience: Professional pharmacists

Al-Rāzī (Rhazes) — Pioneer of Experimental Pharmacy

865–925 — Persian polymath, physician, chemist, and pharmacist — the 'Galen of Persia'

- Kitāb al-Ḥāwī (Liber Continens) — Medical encyclopedia in 26 volumes, including 4 devoted to pharmacy: strength of medicines, simple and compound drugs, preparation of remedies.
- Pioneer of chemotherapy — First to systematically use chemical compounds (mercury, sulfur, arsenic) for medical purposes and alcohol as an antiseptic.
- Domestic medicine — Man lā Yaḥḍuruhu al-Ṭabīb: first domestic medicine guide with 36 chapters of pharmaceutical recipes accessible to the general public.
- Animal experimentation — He first tested his remedies on animals to evaluate their efficacy and toxicity before human administration.

Key Facts

Era: 10th century, Persia

Key work: Kitāb al-Ḥāwī (26 volumes)

Innovation: Systematic chemical compounds in medicine

First: Animal testing for drug safety

Avicenna (Ibn Sīnā) — The Canon and the 700 Preparations

980–1037 — Persian philosopher and physician — author of the Canon of Medicine

- An entire volume on drugs — The Canon dedicates a complete book to simple drugs, describing at least 700 preparations with their properties, modes of action, and indications.
- Systematization — For each medicine: properties, mode of action, indications, contraindications, and precise dosage.
- First formalized clinical trial — In 1025, Avicenna introduces in the Canon the principles of the clinical trial: comparing patient groups, repeating observations, eliminating bias.
- Quantitative pharmacology — He introduces systematic experimentation and quantification in pharmacology, prefiguring modern scientific method.

Key Facts

Era: 11th century, Persia

Key work: Qānūn fī al-Ṭibb (Canon of Medicine)

Innovation: Formalized clinical trial principles (1025)

Scope: 700+ drug preparations documented

Al-Bīrūnī — The Book of Drugs (Kitāb al-Saydalah)

973–1050 — Universal scholar, philosopher, pharmacologist, and geographer

- In-depth knowledge — Detailed description of the properties of medicines, their geographical origin, and their modes of preparation.
- Role of the pharmacist — Al-Bīrūnī clearly defines the role of the pharmacist, his functions, and his professional duties, laying the foundations of pharmaceutical ethics.
- Comparative pharmacology — He compares Greek, Indian, and Persian medical traditions, establishing a universal approach to drugs.
- Fight against counterfeiting — Major contribution to the standardization of drug names and the recognition of falsifications.

Key Facts

Era: 11th century, Central Asia

Key work: Kitāb al-Saydalah

Innovation: Comparative pharmacology

Contribution: Drug name standardization & anti-counterfeiting

Ibn al-Bayṭār — The Botanist and the Universal Pharmacopoeia

1197–1248 — Botanist, herbalist, and pharmacist from Málaga (al-Andalus)

- Kitāb al-Jāmiʿ fī al-Adwiya al-Mufrada — Encyclopedia listing 1,400 plants, foods, and drugs, with 300 original discoveries unknown to the Greeks.
- Botanical travels — From the North African coast to Asia Minor, he collected samples and documented the local uses of each plant.
- First cancer treatment — He describes the use of chicory (hindibāʾ) as a herbal treatment for tumors, a premise of modern chemotherapy.
- European influence — His work translated into Latin in 1758 and used in Europe until the 19th century.

Key Facts

Era: 13th century, al-Andalus

Key work: Kitāb al-Jāmiʿ (1,400 entries)

Innovation: 300 original botanical discoveries

European use: Until 19th century

The Lasting Impact on Modern Medicine

Achievement	Description
2,000+ medicinal substances	Discovered by medieval Arab scholars, expanding the therapeutic repertoire of Antiquity.
First formalized clinical trials	Avicenna (1025) established rules: control groups, repeatability, elimination of bias.
First antiseptics & anesthetics	Purified alcohol and mercury salts as antiseptics; opium and cannabis as anesthetics.
Separation of medicine/pharmacy	Professional distinction with state control (al-muḥtasib), prefiguring modern public health.
Quantitative pharmacology	Experimental approach with dose quantification, prefiguring modern pharmacology.
Contemporary pharmacognosy	Medical botany of Ibn al-Bayṭār and standardized nomenclature of al-Bīrūnī still influence research today.

"If the physician can treat with foods, and not with medicines, then he has succeeded."

— Al-Rāzī (Rhazes)

THANK YOU