THE HISTORY OF ANDALUSIA IS UNIQUE
IN NO OTHER EUROPEAN COUNTRY WAS THERE
~ 500 YEARS OF ARAB/ISLAMIC OCCUPATION

CONTRIBUTIONS TO CIVILIZATION
(Science, Philosophy, Medicine, Architecture)

WHERE IS ANDALUSIA

Sierra Morena - Quadalquivir - Sierra Nevada

The Moorish period was the Golden Age of Andalusia
Cordoba - Seville - Granada
Centers of culture, science & arts

HISTORY
GEOGRAPHY
CONTRIBUTIONS

FOUAD SALIM HADDAD, MD, FACA, DABA

HISTORY OF ANDALUSIA
ANCIENT: 9th cent. BC - 6th cent. AD
Phoenician, Greek, Carthaginian, Roman, Vandal, Gothic

MOORS: 711-1492 - Islamic, Christian, Jewish

ALMORAVIDS: 1021-1086

TARIFA: 1061-1101 - The Tarifa Kingdom

ALMOYAVED: 1092-1172 - Almoravids (Marabites) (as in Zaire)

ALMORAVIDS: 1109-1130 - Almohads (Morabites) (as in Algeria)

1232-1492 - Granada

* Power-Point presentation Dec. 4, 06, Dept. of Anesth., AUBMC, Beirut, Lebanon.
** Clinical Assoc., Dept. of Anesth., AUBMC. Beirut, Lebanon.
ARAB / ISLAMIC CONQUEST OF ANDALUS 11-13

April 36, 711 - Tārik b. Ziyad, from Cantabria, crossed the Strait of Gibraltar on the frigate Narhama, which he named Gibrāl (the Rock).

The conquest started.

IN THE MEAN TIME

Gothic King Roderick of Barcinia (Andalusia) had dispersed his army and anime his troops. He was also enemy of Julian.

Family of the Frankish King retreated to Julian to be helped in regaining power.

Julian contacted Tārik who offered to assist them. The latter agreed on the condition that his forces also received permission to return to their homeland.

IN INITIAL RECONNAISSANCE OF ANDALUS (BAGTHA)

July 19, 711 - Tārik defeated and killed Roderick at the Battle of Guadalete (711). The Gothic army was defeated and the region of Andalusia was conquered.

Tārik continued his conquest and established the Arab Islamic (Abābda) period of history of Spain (Andalusia).
July 10, 710 - Reconnaissance, Tarif bin Maik, sailed from Ceuta to Tarif (Tarif)
April 30, 711 - Invasion, Tarik bin Ziyad, crossed from Ceuta to Jebel Tarik (Gibraltar)
July 19, 711 - Roderick defeated at Guadalete

Arabs crossed Pyrenees and invaded France
By 732 Arabs (Moors) occupied most of Iberia - ANDALUS
SPANISH CALIPHATE
- Cordoba
- Granada
732 – Battle of Poitiers


Arabs (Moors) returned to govern ANDALUSIA A.D. 756. Unmayed Emirate dependent on Damascus SPANISH CALIPHATE. Cordoba, Granada. Creation of a new world state, religion, language and culture.
THE GOLDEN AGE OF ANDALUS

1-9

THE GOLDEN AGE OF ISLAMIC ANDALUS

- 929 - Al-Hakam III deposed Al-Abbasid Caliph, Andalus under independent Roman power
- 929 - 1010 Under Arab-Moorish, independent, Al-Hakam III
- 961-976 - Al-Hakam II
- Both were patriots of learning and art
- Their period marks the height of Moslem rule in the West
- The dawn of the most advanced civilization in the Middle Ages
- Moslem, Christians, & Jews lived harmoniously

ARAHMAN III

(929 – 961)

- Declared himself Caliph, prompting of Andalus
- Great achievement: local, trade, expansion from Byzantium, France, Germany, Italy
- Beginning of Cordoba, major center of politics, economy, and intellectual expansion
- Cordoba became the largest, wealthiest, most civilized city in Islamic Spain
- Multi-ethnic Caliphates: Muslims, Jews, Christians

AL-HAKAM II

(961 – 976)

- A patriot of learning
  - Established free schools
  - Granted land to university in Cordoba
  - Invited professors from the East and provided endowments for their salaries
  - Attracted Christian & Moslem students from Europe, Africa, and Asia
  - Promoted schools of philosophy and medlar
- Established city library (250,000 volumes)
  - Greek texts introduced into Europe
  - Translation of Aristotle, Empedocles, Heracleides, Plato, Ptolemy
- Expanded Great Mosque, constructed Mihrab
- Arabic numerals introduced
HISTORICAL & CULTURAL TOUR OF ANDALUS

GIBRALTAR
MADRID (1993)
TOLEDO (1985)
CORDOBA (1984)
SEVILLE (1987)
GRANADA (1984)

GIBRALTAR (Jebel Tarek)

"Gibraltar will cease to be British on the day that there are no apes on the Rock"

THE APES
MADRID

Entrance of Biblioteca Nacional

Alfonso X - The Wise

Hop-on and Ride bus tour

La estadía en Madrid fue emocionante, llenó de coloridas vistas y un mezcla de hermosos monumentos y calles animadas. Comenzamos nuestro viaje con la visita a la Biblioteca Nacional, un impresionante edificio que refleja la rica historia de Madrid. Luego, nos adentramos en la antigua corte de Alfonso X, conocido como el sabio, y exploramos sus aportes a la cultura y el conocimiento. Finalmente, disfrutamos de un paseo en autobús turístico que recorrió los principales puntos de interés de la ciudad.
TOLEDO

- Toledo became the greatest Muslim learning center. Attracted prominent scholars to study Islamic medicine, civilization and arts:
  - Adelard of Bath (Englishman), Peter Alfonso (Spanish Jew),
    Michael Scot (Scotland), Gerhard of Cremona (Hudism)

- Toledo became famous because of its School of Translators

- By 12th cent, under influence of Alfonso X El-Sabio (The Wise),
  it became a cultural forum within which Christians, Muslims
  and Jews lived together in mutual tolerance and collaborated in
  a School of Translators, responsible for introducing Greek and
  Arabic science and philosophy into the European Renaissance

- Toledo became the intellectual door from which a storehouse of
  knowledge would become known to the West

- SOME PROMINENT SCHOLARS WHO WERE IN TOLEDO

  - Adelard of Bath – Englishman, Philosopher and
    mathematician, first prominent European man to
    arrive

  - Peter Alphonso – (Spanish Jew, converted), became
    physician to Henry I & spread science of Muslims,
    Transl. Arabic astronomical & math. works to Latin

  - Michael Scot, wrote about the transmission of
    scientific culture from Toledo to Bologna via
    the Court of Frederick II, Hohenstaufen

  - Gerhard of Cremona, the greatest translator
THE SCHOOL OF TRANSLATION OF TOLEDO ¹³,¹⁶,¹⁷

"Escuela de Tradutores de Toledo."

• FOLLOWING THE FALL OF TOLEDO, ARCHBISHOP RAYMOND IN THE 12th CENT, FOUNDED A SCHOOL OF TRANSLATION WHICH FLOURISHED UNTIL 13th CENT.

THE TRANSLATING GIANTS:

• GERARD OF CREMONA – Translated > 70 Arabic books
  - Almagest of Ptolemy: the main aim of his trip from Cremona
  - The Canon of Avicenna
  - Almansori of Al-Razi – al-manazir of Ibn Alhaitham
  - Al-Tasrif of Al-Zahrawi – astronomical

• MICHAEL SCOT – JOHN OF SEVILLE – ADELARD OF BATH

GERARD OF CREMONA ¹⁷

(1114 – 1187)

• The greatest and most prolific translator of his times > 70 works in science. He produced first rate transl. directly from Arabic

• His transl. began to be used as textbooks in the new univ(s). founded in Europe & influenced countless generations

• Rise of universities paralleled Gerard’s era of translation activity – Bologna (1150), Paris (1200), Salerno (1250)

• The impact of his work made on prominent thinkers of Europe:
  - Roger Bacon: relied heavily on Arabic thought
  - Albertus Magnus: indebted to Avicenna and Galen
  - Thomas Aquinas: brought Aristotle into church
  - Copernicus: knew of Gerard’s transl. of Ptolemy’s Almagest
CORDOBA

- Cordoba: capital of powerful Umayyad caliphate, one of the most dazzling and greatest cities the world had ever known at the time.

- Located at highest navigable point on the Guadalquivir River.

- Home to famous cathedral, Alcázar, and Museo Arqueológico.

- Formerly the Great Mosque (Mezquita) is now a Cathedral.

- Founded by the Umayyads, circa 785. Conquered by Ferdinand III in 1236.

- Site of frequent impromptu bullfights.
A forest of ~250 columns. Two tiers: sand Stadium arcade (for a shoe arches?/towel arches). Wonder columns.

Stone-shell dome of Al-Mahdi.

Carlos I: "...you have destroyed what was unique in the world."
### Seville

712 – Occupied by Arabs (Moors) (*Istibilla*)
- Present Andalusian capital – Beautiful & Romantic
- Straddles Guadalquivir river – A water highway
- Prospered at Almohad Period (1147–1236)
  - Built Giralda, an Islamic monument
1248 – Seville surrenders to Ferdinand III of Castile
1519 – Magellan set sail from Seville to circumnavigate the globe

<table>
<thead>
<tr>
<th>Year</th>
<th>Event</th>
</tr>
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**El-Cid (Campeador) 1040-1099**
- Arabie- al-sayyid
- Spanish – campeador (champion, Spanish hero)
- Name: Rodrigo Díaz de Vivar
- A Castilian nobleman, became a mercenary captain fighting mainly for the Moors
MOSLEM SCHOLARS IN ANDALUS

ABULKASSEM AL-ZAHRAWI (Abulcasis, Albucasis)

For tracheostomy, he stated
("...It is stated that tracheostomy was performed in former times, but I have never seen it done in our country- and I only state what they say..."

Described how tracheostomy should be done

"Incising the trachea under the 3rd ring...when trachea is opened, surgeon will notice that phlegm comes out and the voice is lost...

"If the patient's pharynx is blocked by any of the tumors and is threatened to die from dyspnea, then tracheostomy should be performed to make patient breath through the wound and escape from death..."
IBN ZUHR (Avenzoar)\textsuperscript{18}

Moslem Scholars in Andalus
Abulcasis Al-Zahravi 936 – 1013 A.D. (943-1013) (Caliphate)
- Born in Zahra, near Cordoba (Caliphate period)
- Court physician of the Unayyid caliphate at its height.
- Greatest sugar-producing Muslim in Islam produced.
- Wrote “Al-Tasir” which, in 30 sections, the last deal with surgery.
  - Contained many illustrations of surgical instruments, most of
  - his own inventions.
  - Laid the foundations of surgery in Europe, Guy de Chauliac,
  - the greatest of medieval surgeons, quoted it 200 times.
  - Translated into Latin 1407. Used for many centuries as manual
  - of surgery in Salerno and Montpellier.

"Wrote "Al-Tasir fi al-
maslahat wa ad-tadhaar"
("النساء في الشفاء و العلاج")
(practical manual of treatment
and diet).

"Al-Tasir" is the basis of
Avenzoar’s renown in the west.
Used as a textbook of
medicine in European
universities all the way through
the 18th cent.

Greatest surgical contributions include new modalities of
treatment and therapy
- Use of diamond point for breaking urinary stone
- Use of alk in the nature of abdominal and intestinal injuries
- Advocates special feeding tube in paralysis of deglutition
- Use of cotton in the management of fractures of the nose
  and vaginal prolapse
- Described new surgical operations such as bowel resection
  and tracheotomy (on goat)
In the issue of philosophy (reason) vs. religion (faith), Ibn Rushd believed that truth must be approached by rational analysis (Aristotelian). Contradicted by Al-Ghazali (Plato), “The Book of Incoherence,” he attempted to harmonize religion with philosophy. This gave impetus to developing rationalism in Christian Europe and emancipation from the thoughts of Plato.
TRIBUTE TO ARAB/ISLAMIC PHILOSOPHERS

The period of Arab philosophers played such a major role in the development of western philosophy that the Renaissance painter Raphael in his School of Athens placed two Arab philosophers, Theodorus and Averroes, among the masters of Hellenic thought. The School is shown at the left ministering to his scholars.

Averroes (Ibn Rushd) Among masters of Hellenic thought

The debt of Latin Medieval philosophy to Greek and Arab

Averroes

Forms

Observation and logic

Plato

Aristotle

Forms

Observation and logic

Oriental, Islamic

Metaphysics

Ethics

Logic

Science

Religion

Renaissance

Greek

Averroes

Peripatetic

The School of Athens

Raphael

School of Athens

Raphael
GRANADA

- The last stronghold and the longest running kingdom of the Muslims in Andalusia.

- Most of Andalusia had been reconquered by Spanish Catholicism ("Reconquista").

- Muhammad ibn Al-Ahmar founded the Nasrid Dynasty which lasted 350 years (1232-1482).

- Alhambra was built.
1474 – Fernando of Aragon married Queen Isabel of Castile – a union between two powerful kingdoms

The catholic monarchs layed seige to Granada Jan. 2, 1492 - Boabdil surrenders

Oct. 12, 1492 – Columbus crossed the Atlantic to the Americas
THE RELIEF OF SURGICAL PAIN

- Cultural and scientific exchanges (travelers, books, scholars) were maintained between Andalus in the West, and Baghdad, Damascus, and Cairo in the East. It is assumed that the relief of surgical pain in Andalus was a product of these exchanges.

- Drs. A. Al-Mazrooa & R. Abdel-Halim in their article of "Anesthesia 1000 years Ago", have reviewed books by medical Arab/Islamic scholars between 9-14th cent.: Al-Razi, Avicenna, Al-Bagdadi, and Ibn El-Quff from the East, and Abulcasis Al-Zahrawi and Ibn Zuhr from the West.

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The following observations were made:
- Use of Al-Murqaid – a plant that induces deep sleep

- Techniques used were either oral (solanum, cannabis, opium) or by inhalation (opium, mandrake, hemlock) the (Spongia Sppmifera)

- Names used: "Al-Tabaaki" (anesthetist), gives Al-Murqaid to allow Al-Jazaelli (surgeon) to perform the operation.

- Monitoring – A third man put a finger on the pulse

- Management of upper airway obstruction:
  - Avicenna advocated a tube made of gold or silver, advanced down the throat to support inspiration
  - Al-Zahrawi, Ibn Zuhr, Al-Bagdadi, and Ibn El-Quff advised tracheotomy when life is threatened

- Use of hollown
CONTRIBUTIONS
(11th-12th)

(Arab/Islamic Era)

PHILOSOPHY

SCIENCES

**INTRODUCTION TO PHILOSOPHICAL INQUIRY**

**MEDICAL**

- Al-Wahidi: “Al-Tabbakh” (Al-Baghdadi) - “All-Healing”
- Al-Zahrawi: “Al-Tasrif”, used as textbook of medicine in European universities until the 16th cent.
- Ibn Rushd: “Al-Ghazali”, highly influence in Middle Age
- Ibn Abi-Dayf - “Collection of Simple Drugs”

**ASTRONOMICAL**

- Al-Sufi: “Al-Adawi” (Algol/Algebra)
- Ibn al-Qalasadi: “Arithmetic”
- Al-Battani: “Al-Asfahani”
- Thabit Ibn Qurra: “physics”

Other Contributions:

- **CITIES POSSESSED UNIVERSITIES**
  - Cordoba (astronomy, math., medicine, theology, law)
  - Granada (theology, jurisprudence, medicine, chemistry, philosophy, astronomy)

- **LIBRARIES FLOURISHED**

- **MANUFACTURE OF WRITING PAPER**

- **INTRODUCTION OF THE “ZERO” AND ARABIC NUMERALS**

- **ASTRONOMICAL GEOGRAPHY - ASTROLOGY BECAME THE MOTHER OF ASTRONOMY -...adjust...unif...math...astronomy**
TRANSMISSION OF ARAB/ISLAMIC KNOWLEDGE

Arab/Islamic learning entered western thought at many points:

- Andalus
- France
- Sicily & Italy
- England

Through Andalus:
- Cultural & scientific contacts were maintained with Baghdad, Damascus, Cairo
- The spread of the Arabic language among Spaniards
- Prominent scholars: Al-Abduss, Al-Zakari, Ibn Zuhr, Averroes, Ibn Al-Baytar
- Introduction of manufacture of paper, spreading to France, Italy and other European countries
- Spread of books subsequent to discovery of printing
- The enthusiasm of Pope Sylvester II: studied Arabic, promoted Arab culture, introduced Arabic manuscripts into Europe
- The School of Translation in Toledo
- The enthusiasm of Alphonso X (The Wise)
- The influence of Gerard of Cremona

Through France:
- Migration of Arabo-Islamic scholars to Montpellier following the Andalusian defeat and the religious fanaticism of the Catholic Monarchs
- Montpellier retained lots of Arabic manuscripts
- In Univ. Paris, Aristotelian philosophy, as introduced by Averroes commentators, was the foundation of learning
- Guy de Chauliac, famous surgeon of the Middle Ages, in his "Chirurgia Magna" mentions surgery of Abulcas, Al-Zahrawi 200 times
Through Sicily & Italy
(977 - Sicily occupied by Arabs)

- School in Arabic in Genoa and School of Translation in Palermo
- 1379 Porrogh (also) translated A-Harri (Razi's) to Latin. Reportedly influenced European medicine considerably
- Sicilian Al-Idrisi - drew the first world map
- Gerbert (later became Pope Sylvester III) - From Spain came to Rome. Became instrumental in introducing Arabic medical knowledge into the west.
- Ibn-Idris was a physician - $2$ transmissions of scientific culture from Toledo to Bologna via the Court of Frederick II in Hohenstaufen.

Through Salerno & Mt. Cassino
Converting the African (1020-1087)

- Played a big part in conveying Islamic knowledge to Christian countries
- His translations were reputedly corrupt and unfaithful, a plagiarist
- He translated Ibn Abbas "Liber Regimii" into Latin. This work was the first which gave the western world a view of Greek medicine.

Roger II - imitated Arab medical practices

Great role of Salerno’s scholars in transmitting knowledge to various European universities (Montpellier, Naples, Padua).

Through England
12th cent. English scholars flocked to Andalusia

- Adelard of Bath first to spread Islamic scholarship to west and translated many Arabic books
- Michael Scot - translated Aristotle's books from Arabic
- Roger Bacon's Optics was based on Al-Hacen's "Instruments Optica": His chemical knowledge from Jabber ibn Hayyan, his philosophy from Averroes
- John of Arden - first English surgeon, copied from Aristotelis word to word
- William Harvey (1578–1657) studied 3 years & graduated from Padua. Discoverer of pulmonary circulation (cf. Ibn Nafea)
THE ARAB/ISLAMIC WORLD IN THE MIDDLE AGES WAS NOT SOLELY ABOUT MILITARY CONQUESTS, IMPERIAL RULE, OR ROTATING DYNASTIES. IN ADDITION TO DEVELOPING PHILOSOPHY, MEDICINE, ASTRONOMY, MATHEMATICS, ARCHITECTURE, AND ART.
CONCLUSIONS

IF ARAB/ISLAMIC CIVILIZATION IS ELIMINATED FROM HISTORY, A HUGE DEFECT IN THE CHAIN OF HUMAN CIVILIZATION WOULD HAVE OCCURRED

HAD IT NOT BEEN FOR ARAB/ISLAMIC SALVAGING GREEK THOUGHT, DEVELOPING, AND PASSING IT TO WESTERN EUROPE

EUROPEAN RENAISSANCE WOULD HAVE BEEN MUCH DELAYED
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The works of Arab philosophers played a major role in the development of western philosophy. The Renaissance painter Raphael, in his School of Athens, placed the Arab philosopher, Averroes (Ibn Rushd), among the masters of Hellenic thought. The text is shown in the diagram on the top right.
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- Most of Andalus had been reconquered by Spanish Catholics (“Reconquista”).
- Mohammed I (the Al-Ahmar) founded the Nasrid Dynasty which lasted 250 years (1232-1492).
- Alhambra was built.

GRANADA Aerial view Al-Hambra

Alhambra’s anatomy

Nasrid Palace

Generalife

“Alhambra’s Alhambra”

Grazalema

Carlos V Palace
GRANADA

ALHAMBRA (red stones)

Snow-capped Sierra Nevada

Granada - Alhambra
1474 – Fernando of Aragon married Queen Isabel of Castile – a union between two powerful kingdoms

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  - Avicenna advocated a tube made of gold or silver, advanced down the throat to support inspiration.
  - Al-Zahrawi, Ibn Zuhr, Al-Baghdadi & Ibn El-Quff advocated tracheotomy, when life is threatened.

- **Use of bellows**.
CONTRIBUTIONS

(Arab/Islamic Era)

PHILOSOPHY

SCIENCE

INTRODUCTION TO PHILOSOPHY / MEDICINE

• AL-FARABI (872-950 AD) - The Neoplatonist "Commentator" (p. 131) - a series of treatises of Aristotle's works and purifying their contents
• His writings became prescribed study in Paris, Paris.
• The intellectual movement initiated by Avicenna continued to be a driving factor in European thought until the birth of modern experimental science

• AL-QURAN (1175-1240 AD) - A philosopher, theologian, astronomer
• IBN KHALDOON - The greatest historical philosopher

INTRODUCTION TO MEDICINE

• ABU AL-QASIM AL-IZZI (c. 936-1013) - "Al-Ghazali" Laid the foundations of surgery in Europe
• IBN AIJAZ (c. 930-1007) - "Al-Halal" - used as a textbook of medicine in European universities until the 16th cent.
• IBN BAYATI (c. 930-1007) - "Corporis", highly valued in the Middle Ages
• IBN AL-FAYZAH - "Collection of Simple Drugs"

ASTRONOMICAL

• AL-WADHDAN (c. 930-1007) - Al-Razi (Al-Razi) - Al-Malik (Alg., Alg.)
• THabit al-Tabari (Alg.) - Al-Ma'mun (Alg., Alg.)
• Thabit Ibn Qurra (Alg.) - Al-Ma'mun (Alg., Alg.)

Other Contributions:

• CITIES POSSESSED UNIVERSITIES
  Cordoba (astronomy, math, medicine, theology, law)
  Granada (theology, jurisprudence, medicine, chemistry, philo., astronomy)

• LIBRARIES FLOURISHED

• MANUFACTURE OF WRITING PAPER

• INTRODUCTION OF THE "ZERO" AND ARABIC NUMERALS

• ASTRONOMICAL GEOGRAPHY - ASTROLOGY BECAME THE MOTHER OF ASTRONOMY...
TRANSMISSION OF ARAB/ISLAMIC KNOWLEDGE

TRANSMISSION OF ARAB/ISLAMIC LEARNING

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- France
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- England

Through Andalus

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- The spread of the Arabic language among Spaniards
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ANDALUSIA

9) Through Sicily & Italy
(977 - Sicily occupied by Arabs)

- School in Arabic in Gerona and School of Translation in Palermo

- 1379, Faragut (from) translated A-Hasawi (Rashid) to Latin. Reportedly
  repeated, influenced European medicine considerably.

- Sicilian Al-Idrisi drew the first world map.

- Gerbert (later became Pope Sylvester II) from Spain went to Rome. Became
  instrumental in introducing Arabistic knowledge into the west.

In Padua, Rinaldo Columbus (1519), Jes. Tull. Cirr. (of Ben Nofly)

- Medical Sect - "Wrote" // Transmission of scientific culture from
  Toledo to Bologna // in the court of Frederick II, Holy Roman Emperor.

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92) Through Salerno & Mt. Cassino

- Constance the African (1020-1087)
  - Played a big part in conveying Islamic
    knowledge to Christian countries.
  - His translations were scrupulous-accurate
    and well-researched. A plagiarist.

- He translated Al-Abbasi "Liber Regim" into Latin. This work was the first
  which gave the western world a view of Greek
  medicine.

Roger II - imitated Arab medical practices

Great role of Salerno’s scholars in transmitting knowledge to
various European universities (Montpellier, Napoli, Padua)

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98) Through England

12th cent., English scholars looked to Andalusia

- Adelard of Bath: first to spread Islamic scholarship to west
  and translated many Arabic books

- Michael Scot - translated Aristotel’s books from Arabic

- Roger Bacon’s Optics was based on Al-Abbasi’s "Treatises
  Optica". His chemical knowledge from Jabir ibn Hayyan. His
  philosophy from Avicenna.

- Ibn al-'Arabi - first English surgeon, copied from Andalusia
  word to word.

- William Harvey (1578-1657) studied in Padua. Discovered
  of pulmonary circulation (cf. Ibn ‘Ali in
  "Hikayat")
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SOME ANDALUSIAN ARAB/ISLAMIC MONUMENTS:

- Al-Hambra - Granada
- The Mezquita - Cordoba
- Giraldillo
- Torre del Oro
- Seville
- Guadalquivir
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