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**Review**

# **The History of anatomy in Persia**

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20pp,

14 Figures

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# **Five Eras of the History of Persia**

- 1. The period of Elamites, Medes, early Persians and Babylonians,**
- 2. Following the establishment of the Persian Empire(6<sup>th</sup> century BC to 7<sup>th</sup> Century AD),**
- 3. After Islamic Conquest of Persia and the Ascending of Baghdad(7<sup>th</sup> to 13<sup>th</sup> Century AD)**
- 4. The Mongol Invasion of Persia and the Fall of Baghdad (13<sup>th</sup> to 18<sup>th</sup> Century Ad)**
- 5. Modern Persia (since the 18<sup>th</sup> century AD)**

# 1. The period of Elamites, Medes, early Persians and Babylonians,

Civilization of Susa.....20 millennia BC

Kingdom of Elam,... cuneiform writing system

Babylonians

code of Hammurabi(6<sup>th</sup> King of the first Dynasty of Babylon)

penalties for iatrogenic errors(Fig 1)

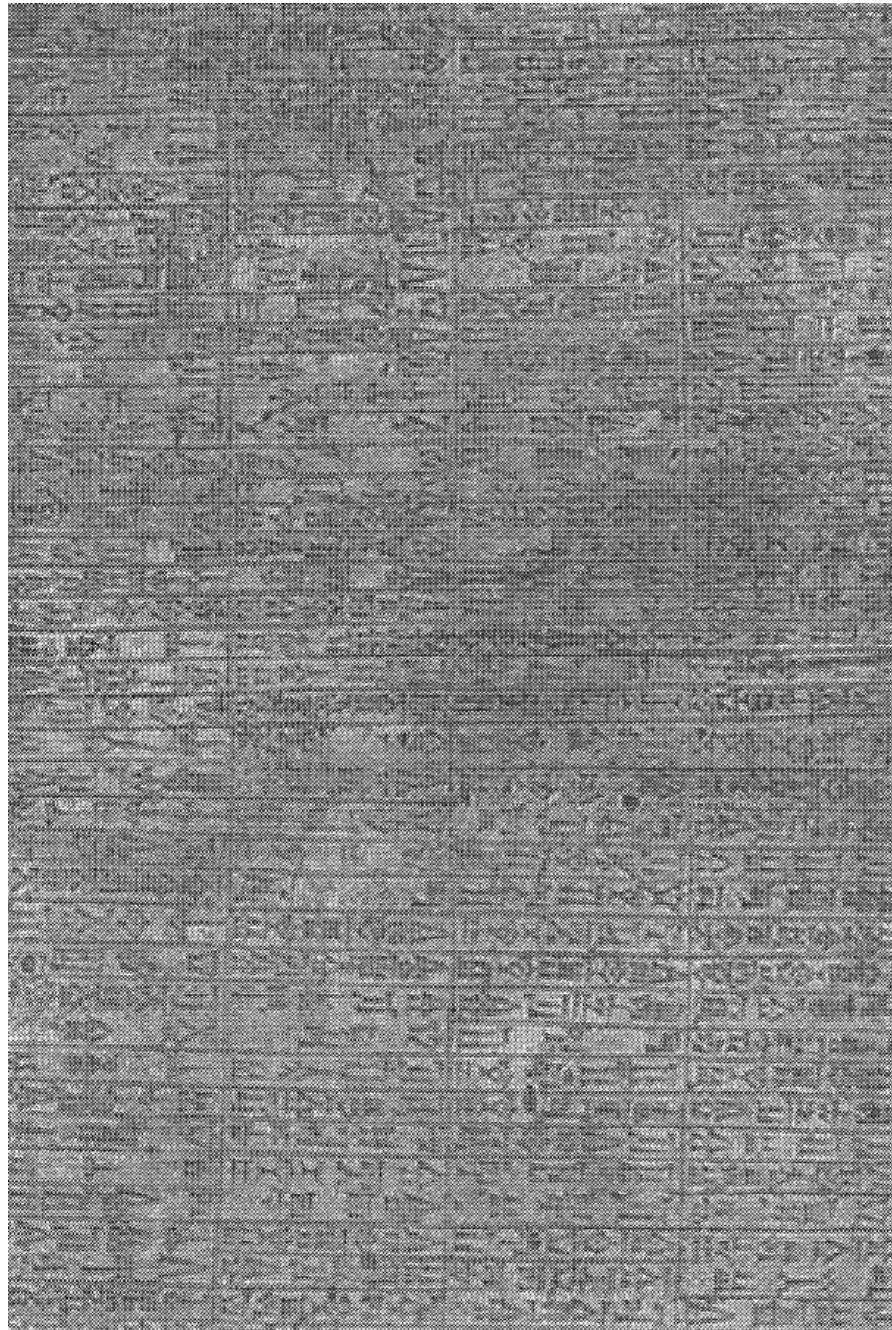
model of a sheep's liver(Fig 2)

anatomy, physiology, pathology of animal in Babylonian Talmut(Fig 3)

human dissection: human bones 248 and muscles , two bellies of the psoas muscle,

dissection of human bodies(first use), experiment upon animals

Fig. 1 Ancient Babylonian Cuneiform script dealing With the Code of Hammurabi. As the first written code of laws, This Code covered extensive Medico-legal issues.



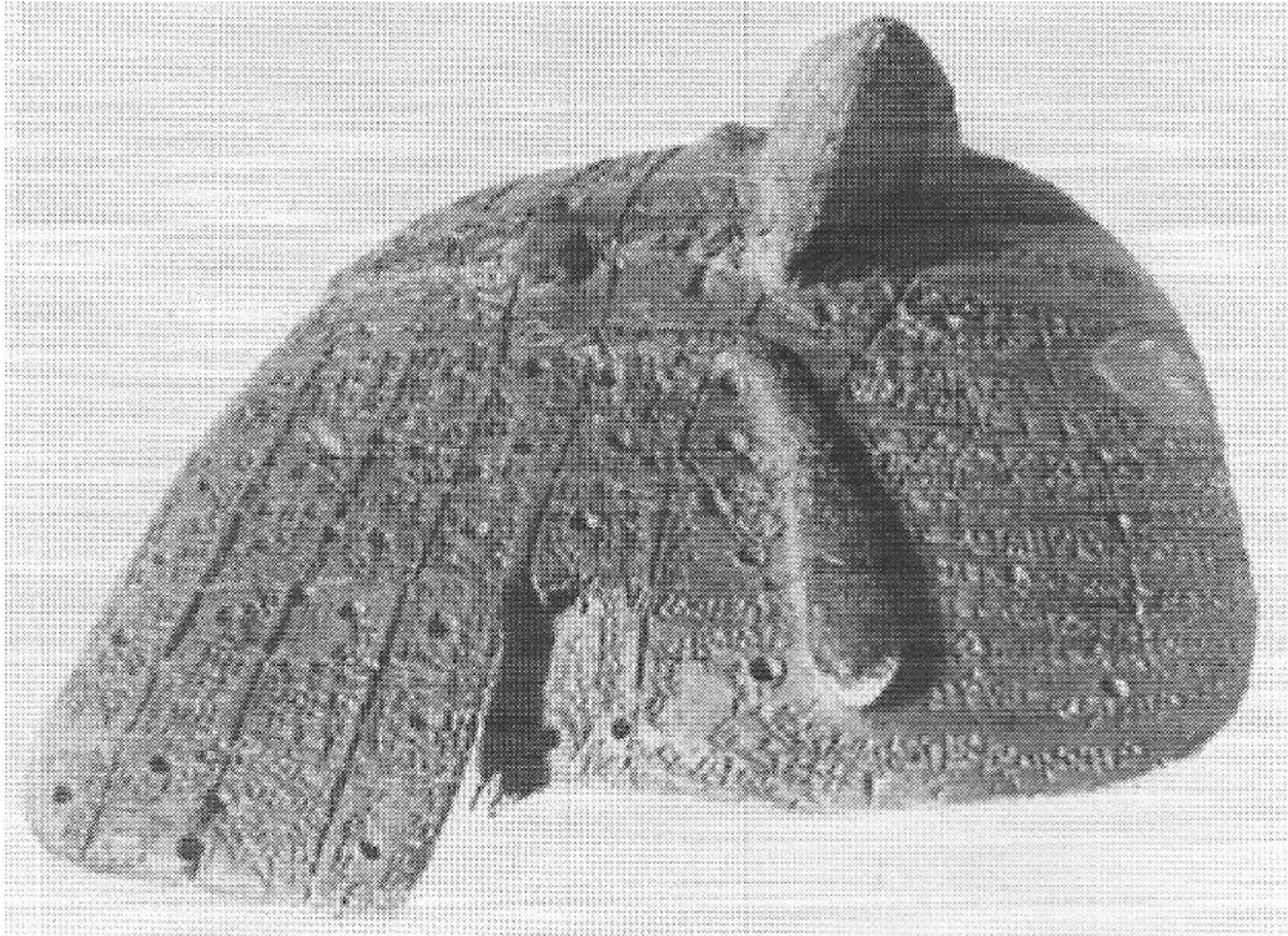


Fig. 2 Babylonian anatomical model of a sheep's liver from the 19<sup>th</sup> century BC.



Fig. 3 The first page of the Babylonian Talmud (Talmud Bavli, Vilna Edition).

**2. Following the establishment of the Persian Empire(6th century BC to 7th Century AD),**

**The Achaemenian(Achaemenid) Dynasty(558 or 559-330 BC)**

cyrus the Great(558 or 559-530 BC):

used bodies of the condemned criminals for dissection and medical research,

Avesta(Bundahishn): concept of Macrocosm and Microcosm,  
skin= sky, flesh= earth, bones= mountain, veins= rivers,  
blood= water in the see, hair= plants, hairier= forests

**Sassanid(226-652 AD) and the Academy of Gondishapur**

Shapur I.....Gondishapur

Shapur II.....Academy of Gondishapur.....Hospital, Nestorian physicians

Khosrow Anoshirvan....accept anyone from other religions(like Greeks)

.....destruction of libraries and scientific concept by Arab invaders.

### 3. The Islamic Conquest of Persia(637-651 AD) and the ascendancy of Baghdad (762-1259 AD): the Islamic Golden Age

Destruction of major libraries,

Translation of the literatures into Arabic,

The Koran: different opinions:

Moore: embryogenesis of the organs of hearing, eyes, brain

Savage-Smith: No anatomical dissection,

Wakim: animal dissection(eye),

Abdel-Halim, Abdel-Maguid: anatomy deepen the appreciation of God's wisdom,

Abul Waleed ibn Rushd & Fakhr al-Din al-Razi: description of the human body

Batirel(1999): animal dissections.

Abbasids(750-1256 AD): Al-Mnsur...Baghdad as capital, reconstruct Gondish.

invite Jirjis Bukhtyishu as head, set up hospital,

House of Wisdom; Al-Mamun: call many translators from many countries to translate Greeks's books as well as others,

57 translators ; Abu-Reyhan Birooni(973-1048)...Islamic Golden Age!



### **3. The Islamic Conquest of Persia(637-651 AD) and the ascendancy of Baghdad (762-1259 AD): the Islamic Golden Age**

- a. Abu Zakariya Yuhanna Ibn Masawath, Mesue(777-857 AD)...The Christian Persian Physician
- b. Ali ibn Sahl Rabban al-Tabari(807- 870 AD)...Jewish from Merv of Tabaristan
- c. Abubakr Muhammed ibn Zakaria Razi, Rhazes(865- 925 AD)...The Persian of Ray
- d. Abubakr Rabi ibn Ahmad Joveini Bukhari(?- 983)...from Bukhara of Old Persia
- e. Ali ibn Abbas al-Majusi, Hally Abbas(930- 994 AD)....Zoroastrian from Ahwaz
- f. Abu Ali al-Hussain ibn Sina, Avicenna(980- 1037 AD)...
- g. Zinn-ol-Abedin Seyed Esmail ibn al-Hussain ibn Mohammad ibn Ahmad al-Jorjani, Hakim Jorjani(1042-1137 AD)....Jorjan, northeastern Persia

**a. Abu Zakariya Yuhanna Ibn Masawath, Mesue(777-857 AD)...The Christian Persian Physician**

During Calif al-Mutasim, a Persian Christian, dissected apes, wants to autopsy his retarded son(dull),

Director of the “The House of Wisdom”

Editing(in Arabic):

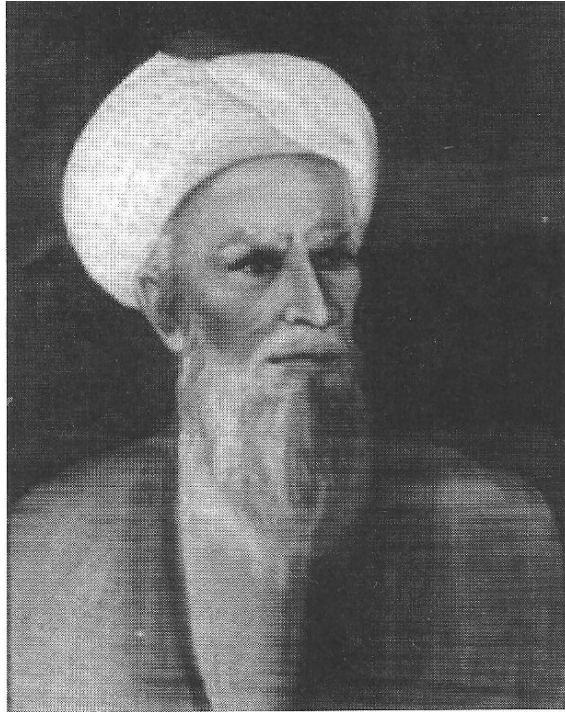
*Kitab al-Kankash le-Mashajer al-Kabir...*80 sections, 23-26 facial nerve paralysis, *Daghal al-Ain*, on embryology, on diet, *Kitab al-Hawass al-agdiyah*,

His student; Hunayn Ibn Ishaq wrote “*Al-Ashr Magalat fi al-Ayn*” and translation of the anatomical writing of **Galen** (see P28)

**b. Ali ibn Sahl Rabban al-Tabari(807- 870 AD)...Jewish from Merv of Tabaristan,**

Firdous al-Hikmat(in Arabic):information from Greek, Syrian,Persian, Indian: embryology, explanation of the brain, nerves, heart, vessels, heart, stomach, voluntary and involuntary movements.

c. Abubakr Muhammed ibn Zakaria Razi, Rhazes(865- 925 AD)...The Persian of Ray- Learned from Al-Tabari,



**Kitab al-Mansuri:** simple organs anatomy: bones, nerves, muscles, veins, arteries and compound organs: eyes, nose, heart, intestines seven cranial nerves and 31 spinal nerves, sensory and motor branch of laryngeal nerve some disagreement to **Galen** on hemiparesis (no relation to ventricles)

**Kitab al-Hawi:**

Treatise on smallpox,, measles

Differential diagnosis, influence of diet, music therapy

**Fig. 4 Zakaria Razi**

#### d. Abubakr Rabi ibn Ahmad Joveini Bukhari(?- 983)...from Bukhara of Old Persia

Pupil of Rhazes

***Hidayat al-Mutaallimin fi al-Tibb***(975 AD) in Persian,(anatomical Persian terms):

He did human dissection by himself,  
eye, nervous system, brain arteries and their branches (circle of Willis),  
cardiac innervation, recurrent laryngeal nerve, innervation of alimentary tracts,

#### e. Ali ibn Abbas al-Majusi, Hally Abbas(930- 994 AD)....Zoroastrian from Ahwaz

***Kitab al-Maliki***(a medical encyclopaedia) (Fig. 5), in Arabic, more practical than Canon of Avicenna, was translated and used as textbook of surgery in schools across Europe, novel surgical method for the removal of spinal tumors and goitres,

disprove the passage existed between right and left ventricles(against Galen, Avicenna),

Two layers of fibers in the wall of the pulmonary arteries,

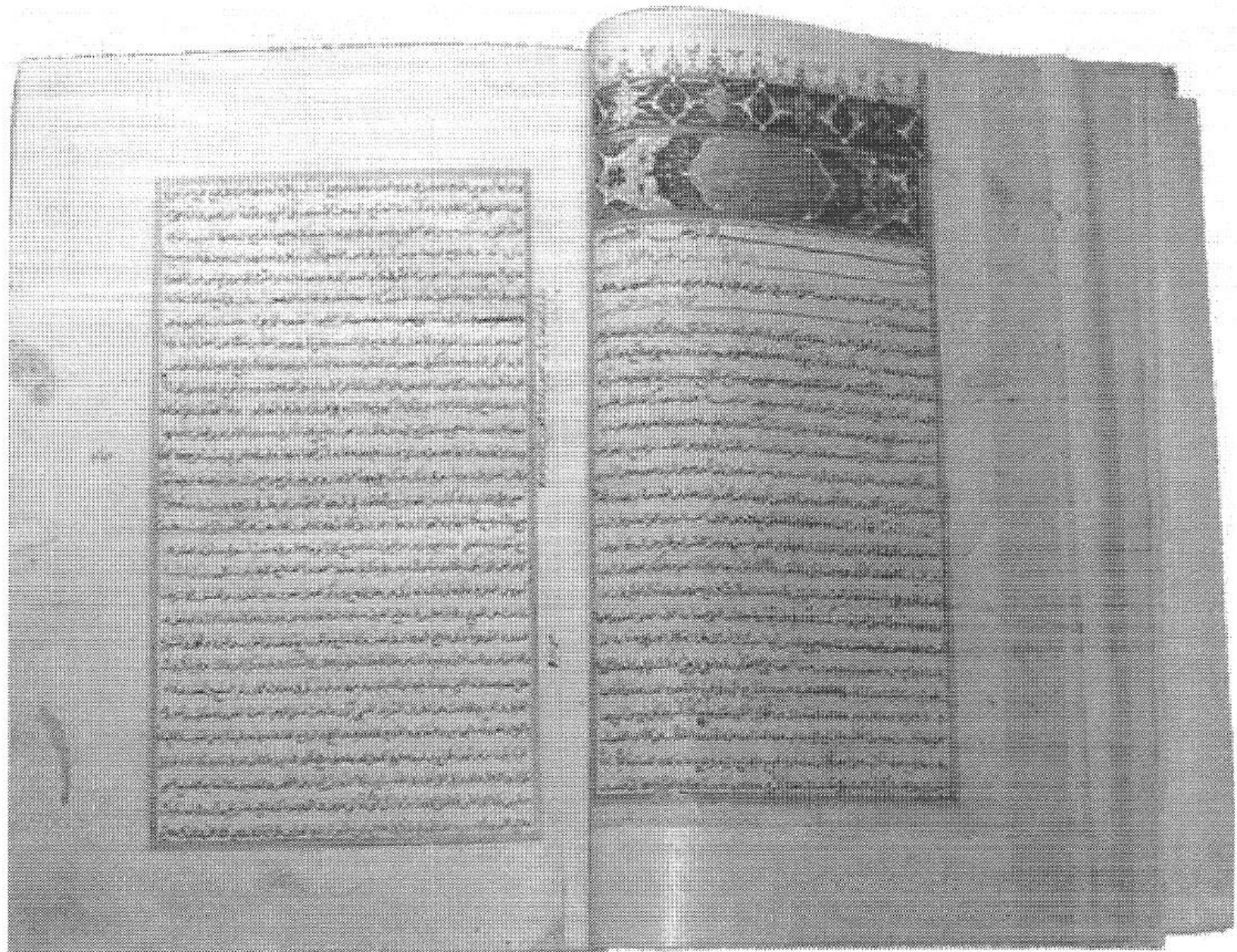


Fig 5 Page from the *Kitab al-Maliki* by Ali ibn Abbas C. 965 AD.

## f. Abu Ali al-Hussain ibn Sina, Avicenna(980- 1037 AD)...



**Fig. 6**

Anatomy of simple organs, diseases,  
Aorta contain three valves, nerve and muscular  
movements, 6 extra-ocular muscles, trigeminal nerve,  
Gland excretory duct obstruction, vertebrae, cerebellum, caudate nucleus,  
No nerves to liver, spleen and kidney,

Physician, philosopher,  
astronomer, encyclopaedist,  
mathematician, politician,  
governor, administrator,

Was born in the village of  
Afshaneh near Bukhara, died  
at 58 in Hamadan,

Human dissection in secret,

***Al-Qanun fi al-Tibb*** in  
Arabic (five parts) but  
translated to several  
languages and became main  
medical text in Western  
medical school for 600 ys,

**g. Zinn-ol-Abedin Seyed Esmail ibn al-Hussain ibn Mohammad ibn Ahmad al-Jorjani, Hakim Jorjani(1042-1137 AD)....Jorjan, northeastern Persia**

A court physician of Khwarazm, pupil of Ali ibn abi Sadegh (a former pupil of Avicenna),

***Zakhireyei Khwarazmshahi***, a medical encyclopaedia in Persian, Hebrew, Turkish, composed of ten books, contain human body structures, optic nerve(in agreement to Galen and against Avicenna about nerve traveling),

Three body fluid: intravascular, interstitial, intracorporeal,

Relation between goitre and exophthalmia,

***Al-Aghraz-o-Tebbieh, Khofieh Alali***: two synopses, ***Zobdat al-Tibb*** (*treatise on Anatomy*),

He died in Merv, the capital of Seljug Sultan Sanjar ibn Malikshah

## 4. The Mongol Invasion of Persia and the Fall of Baghdad (13th to 18th Century AD)

Fall of Abbasid Caliphate,

Ilkhanid dynasty was based in three capitals: Tabriz, Maragha, Baghdad,

Arts and science to flourish,....first colour illustrated anatomy text in Persia,

Introduction of Chinese anatomical ideas: *Tansuq-nama-yi Ilkhani dar Funun-i Ulum-I Hata* (1314 AD)....astronomy, magic Medical writing as much theological and political as scientific



## 4. The Mongol Invasion of Persia and the Fall of Baghdad (13th to 18th Century AD)

### Nasir al-Din Tusi(1201-1274), human variation and human evolution



**Fig. 7 Nasir al-Din Tusi**

Jafar Mohammad ibn Mohammad ibn al-Hassan al-Tusi, Muhaqqiq-I Tusi, Khwaja-I Tusi  
Was born in Tous of Khurasan, from a Shiite,  
During Hulegu Khan(grandson of Genghis Khan)  
leadership, become as a Minister of him.  
Died in Kazemain

Say about **evolution(before Darwin)**: organisms that can gain new features faster are more variable, so gain advantage over other creatures, humans were driven from advanced animals.

64 treatises on astronomy, algebra, arithmetic, trigonometry, medicine, mataphysics, logic, ethics, theology.

# 4. The Mongol Invasion of Persia and the Fall of Baghdad (13th to 18th Century AD)

## Mansur ibn Muhammad ibn Ahmad ibn Yusuf ibn Ilyas, ibn Ilyas (1380-1422 AD)



from Shiraz, and a family of scholars and physicians, during Pir Muhammad ibn Umar ibn Timur **Kifaya-yi Mujahidiya** or **Kifaya-yi Mansuri** based on Galenic dissection,

**Tashrih-i Mansuri= Tashrih-i Badan Insan: Persian**, seven sections: Bones (Fig. 11), Nerves (fig. 9), Muscles (fig. 12), Veins (Fig. 10), arteries, fetus, organs, human embryology(unique)... many color illustrations:pregnant woman (Fig. 13), naked female, heart as most important organ(agree with Avicina), Masuri’s anatomy a transformation of **Galenic** dissection to a prophetic tradition(in respect to Koran, Islamic leaders, strengths of Islam.)

Fig. 8 Excerpt from (Tashrih Badan-I Insan)

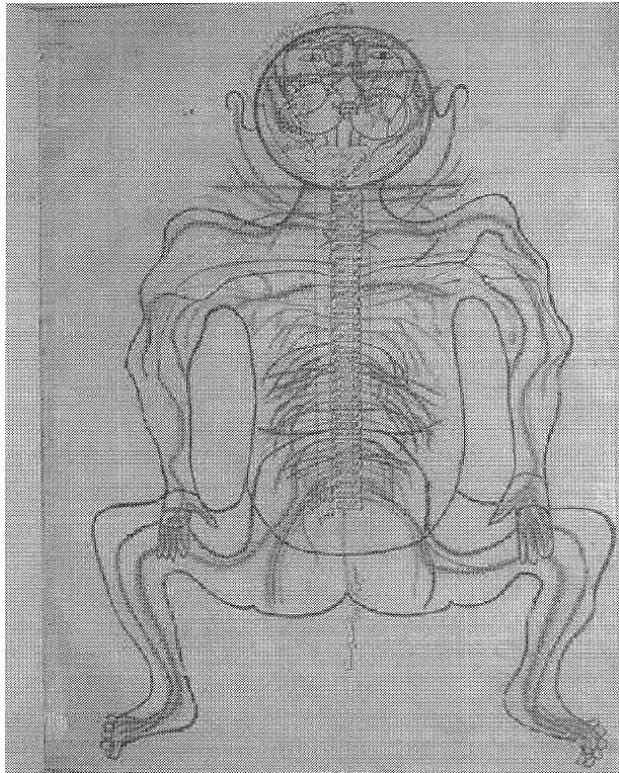


Fig. 9 Drawing of the nervous system from Mansuri's text.

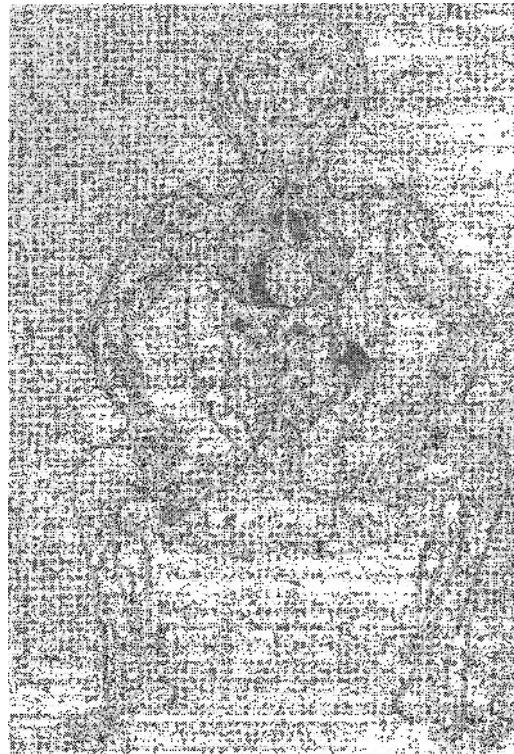


Fig. 10 Drawing of the venous system from Mansuri's text.

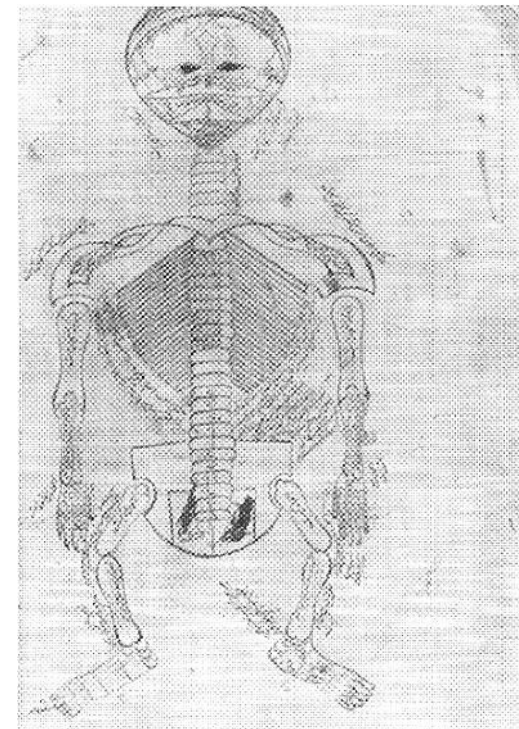


Fig. 11 drawing of the skeletal system from Mansuri's text.



Fig. 12 Drawing of the named skeletal muscles from Mansuri's text.

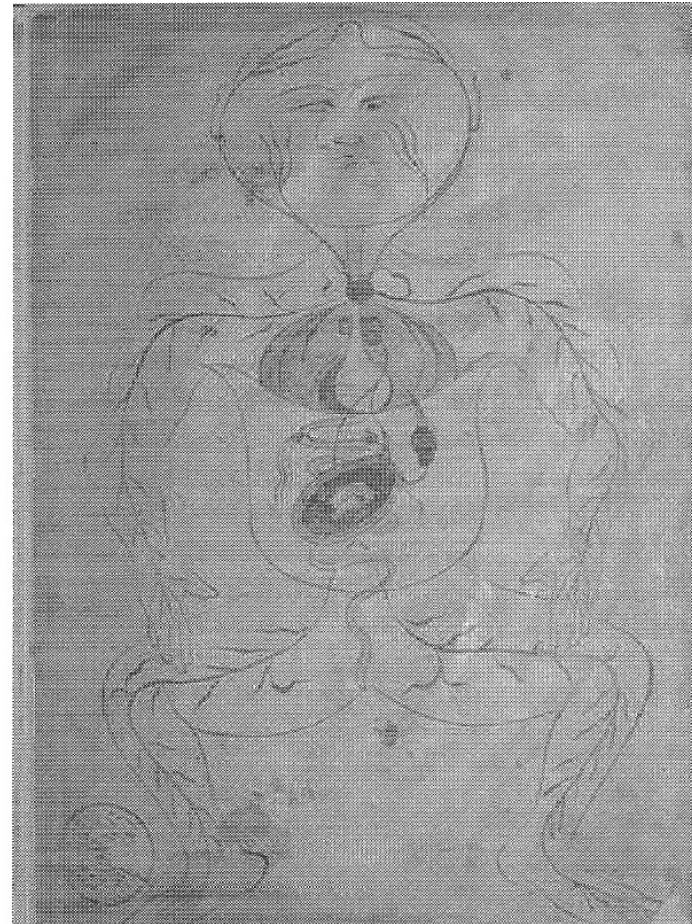


Fig. 13 Drawing of a pregnant Female from Mansuri's text.

## 4. The Mongol Invasion of Persia and the Fall of Baghdad (13th to 18th Century AD)

The Safavid period(1501- 1722 AD) and the reconciliation of prophetic and **Galenic** traditions

Put an end to Ilkanids, Ak koyulu, the last,  
Shia as the state religion, scientific withdrawal, popular prophetic medicine,  
No new ideas and medical innovation,

***Kholasat al-Tjareb*** by Mohammad Baha al-Dawla: experience of diseases as  
whooping cough, febrile skin, eruption, syphilis,

***Bihar al-Majilisi*** by Mohammad Bqir al-Majilisi: reconciliation between Imam  
prophetic medicine and **Galenic** tradition,

## 4. The Mongol Invasion of Persia and the Fall of Baghdad (13th to 18th Century AD)

Islamic Jurists, prophetic medicine and the **Galenic** tradition

Mohammad Bqir al-Majilisi: born in Isphehan, from a Shiite family, fanatic, Royal to shah Sultan Husayn and was Mulla Bashi, eradicate Sofism, Sunnis, pesecute Jews, Zoroastrians, Christians,

***Bihar al-Anwar*** with 48 chapters: organs of hearing, neck, spinal cord, thorachoabdominal system, reproductive organs, bones, tendons, ligaments, cartlages (many added to Mansur's anatomy)= compatibility between the prophetic and **Galenic** tradition. Heart as most important organ.

Allamah Ahmad ibn Abd al-Munium al-Damanhuri: ***al-Qawal al-Sareeh fi ilm al-Tashrih***: about dissection,

several Persian anatomical treatises: **Tibb al-Akbar** by Mohammad Akbar Arzan, A book of traslation of the Arabic workby a Persian=Nafis ibn Ivad Kirmani  
Other 40 anatomical manuscripts, 13<sup>th</sup>- 19<sup>th</sup> centuries (next page table 2)

**Table 2** Several anatomical manuscripts from Persia dated between the 13th and 19th centuries

Book	Author	Year/century (AD)	Comments
<i>Tashrih: Mokhtasari dar lmi</i> (Anatomy: A Synopsis of Science)	Abi al-Majd al-Tabib al-Bayzawi	13th century	a Persian anatomical book in two sections on simple and compound organs
<i>Ganooncheh</i> (Handbook of the Canon)	Mahmud ibn Mahammad ibn Omar Chaghmini	14th century	a handbook of medicine. The second chapter on anatomy was acquired from Joveini, Avicenna, and Jorjani. The author was from Khwarazm.
<i>Arjozat fi Tashrih-i Badan</i> (A Treatise on Human Anatomy)	Rashed ibn Amireh Sani	~15th century	a summary of human anatomy
<i>Tashrih al-Sadr</i> (Anatomy of the Thorax)	Unknown	1632	in Arabic and includes Hellenic and Islamic interpretations
<i>Tohfat al-Mumenin</i> (Gift of Mumen)	Mohammad Mumen Hussaini (Hakim Mumen)	1656	mostly on medicine and pharmacology and includes two illustrations for the body vasculature and bloodletting
<i>Tashrih al-Maa</i> (Anatomy of the Gut)	Unknown	1684	in Persian and about the anatomy and diseases of the alimentary tract
<i>Tadbir al-Abdan</i> (Body Science)	Abdolmonaam ibn Abdollah al-Aziz al-Ameli al-Maftuni	1685	on medicine, with a brief anatomical review. The original text is attributed to Imam Reza, a Shiite Imam in Mashhad
<i>Atabakye</i>	Unknown	1779	written in three chapters on ophthalmology. The first chapter includes the anatomy of the eye
<i>Mersad al-Tashrih</i> (Research in Anatomy)	Timur ibn Muhammad Vali Mirza	1840	in Persian and dedicated to Mohammad Shah Qajar and deals with the anatomy of body articulations and simple organs
<i>Merat al-Akvan</i>	Timur Mirza	1840	in Persian and dedicated to Hadji Mirza Agasi and contains a traditional discussion on human embryogenesis
<i>Moludiyeh</i>	Ali Mohammad Tabib Isfahani	1888	on the anatomy of the genital organs, embryology and obstetrics. Includes Persian equivalents of western terminology
<i>Tashrih</i> (Anatomy)	Ali ibn Abd al-Jalil	1879	Translation of a French book, includes musculoskeletal structures and embryology. The author is a graduate of Dar al-Funun

## 5. Modern Persia (since the 18th century AD), academic contact with the West

Abbas Mirza(1789- 1833) sent scholars abroad to study modern science,

Hadji Baba was the first to study anatomy, surgery in Britain: *Kitab al-tashrih* in Arabic.

### Modern Persia and the foundation of the Dar al- Funun(Institute of Technique)

Mirza Tagi Khan Amir Kabir; the prime Minister of Naser-ad-Din Shah Qajar,

**Dar al-Funun** designed by a British educated man, Mirza Reza Mohandes,

John Dawud Khan, seven Austrian teachers were employed, Dr. Jacob Eduard Polak

By 1891: 16 Persian and 26 European instructors.

**Who is Dr. Jacob Eduard Polak?**





## Jacob Eduard Polak(1818- 1891

A Jewish, born in Gross-Morzin, Bohemia, studied medicine in Prague and Vienna,

Arrived in Persia on Nov. 1851 and spent 9 ys. Become royal physician of Naser ad Din shah in 1855

Wrote *Human Anatomy* in French and translated Into Persian by Mirza Mohammad Hossein Afshar, Published in 1852

Compiled medical dictionary in Persian, Arabic... First **autopsy** (of an European man) in Iran in 1854.

## Anatomy in the 20<sup>th</sup> and 21<sup>st</sup> centuries

With constitutional revolution in 1906: students were sent to Europe to study medicine,  
Establishment of Tehran Univ. in 1917: **Ali Falati**: first anatomy course in 1934,

**Amir Aalam**: graduated from Univ. of Lyon, surgeon and anatomist, prof. of Dept. of Anatomy, published first anatomical textbook in nine vols.

Prof. **Mostafa Habibi**: histology, embryology, established first course of anatomy ,

Prof. **Jamaledin Mostaghimi** (see next page): born in Ghasrdasht/Shiraz, 1914 established first classic dissecting rooms in Teh. And other Univs.

1979 Islamic revolution and closure of the Univs, No body dissection for years.  
more about J. Mostaghimi....

### **Jamaledin Mostaghimi (1014- 2005)**

Graduated from Teh. Univ., studied anatomy and surgery under an American Surgeon, Dr. Bler, established first anatomy room at Teh. Univ., went to Mashhad to Stablish medical school and 2<sup>nd</sup> dissection hall, PhD. programme in anatomy, 30 ys teaching anatomy, was remembered as the father of modern anatomy. He discovered deep layer of the detoid ligament of the ankle and two bundles of the Ant. commissure of the brain

### **Saeid Kazemi Ashtiani (1962-2005)**

Born in Teh., studied physiotherapy and then anatomy at Iran(?) Univ., PhD. in anatomy, and embryology from Tarbiat Modarres Univ., founded Royan Institute, Played influential role in advancing the anatomical sciences.

### **Others**

**Mostafa Habibi, Hamid Barar, Manuchehr Hakim**, others: publishing books  
About anatomy, embryology, histology

# TRADITIONAL MEDICINE

## Human temperaments

Four fluids: blood, yellow Bile, black bile, phlegm,

**Blood**- sanguine= social,

**Yellow bile**-choleric= with energy, passion, charisma,

**Black bile**-melancholic= creative, Kind, considerate,

**Phlegm**- phlematic= dependability, kindness, affection

Balance between them make healthy body,

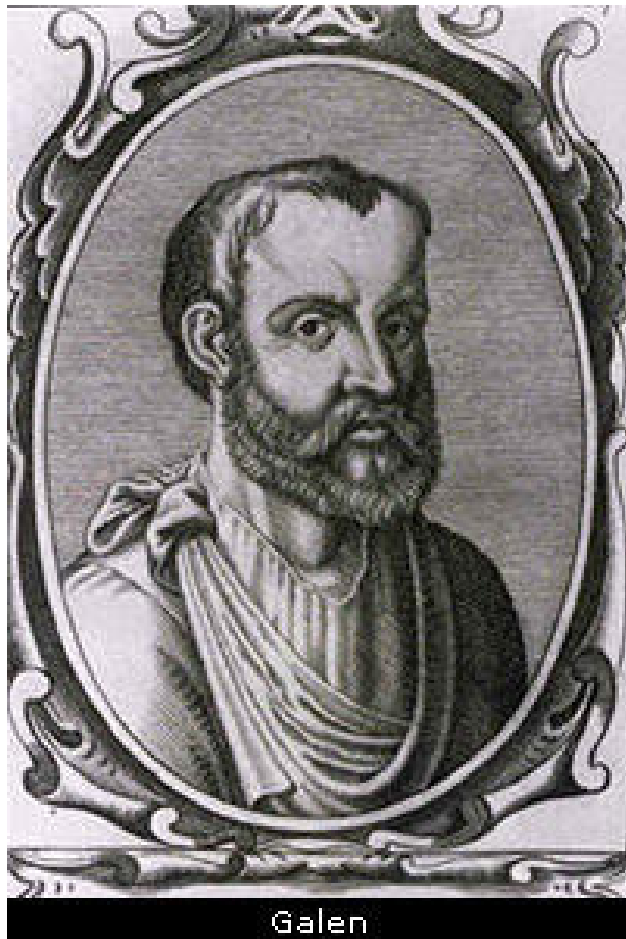
Dissection of the apes, pork, other animals,  
Two circulatory systems, dark blood(liver),  
light blood(heart)

**Aelius Galenus** or Claudius Galenus

Born: 130 AD, Pergamon, Turkey

Died: 210 AD, Rome, Italy

Nationality: Greek → Translated to Arabic → Translated to Europe(1100AC)



# **INTERMEDIAL MEDICINE**

**ISLAMIC Medicine**

**Medicine in the AGE OF MONGOLS**

**Anatomy in the Age of Enlightenment**

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## Anatomy in the Age of Enlightenment



**Andreas Vesalius** (1514-1564)

From  
Belgium

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