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Review

The History of anatomy in Persia

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20pp, 14 Figures 53 references

Five Eras of the History of Persia

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

1. The period of Elamites, Medes, early Persians and Babylonias,

Civilization of Susa......20 millennia BC Kingdom of Elam,... cuneiform writing system

Babylonians

code of Hammurabi(6th King of the first Dynasty of Babylon)

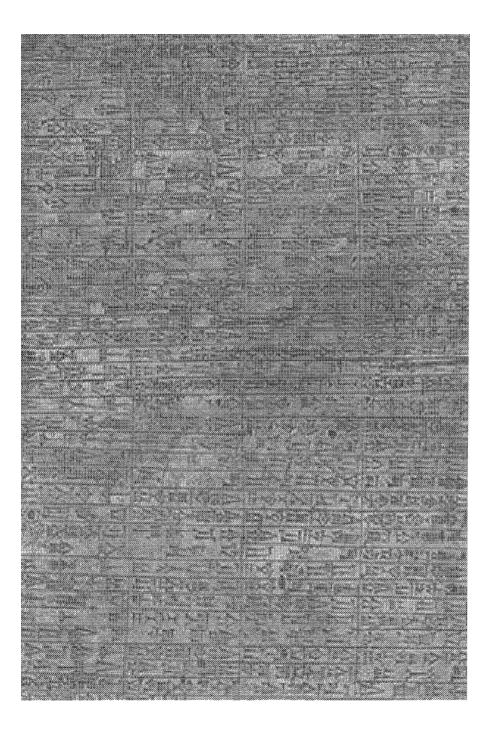
penalties for iatrogenic errors(Fig 1)

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.



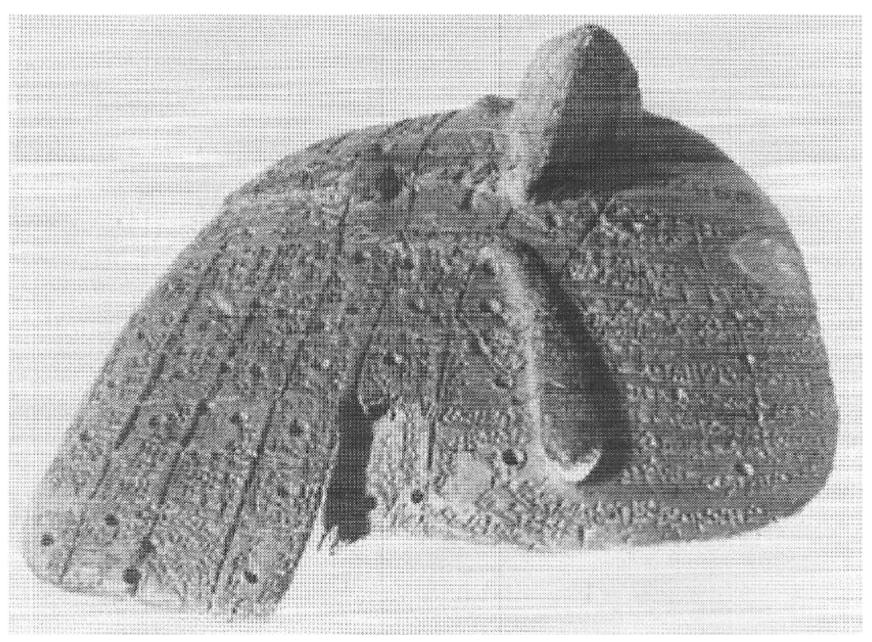


Fig. 2 Babylonian anatomical model of a sheep's liver from the 19th century BC.

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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 ascendency 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 ascendency 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 retardated son(dull), Director of the "The House of Wisdom"

Director of the "The House of Wisdom"

Editing(in Arabic):

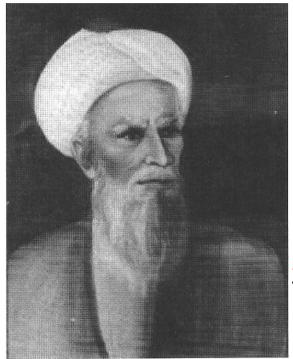
Kitab al-Kankash le-Mashajer al-Kabir...80 sections, 23-26 facial nerve paralysis ,*Daghal al-Ain*, on embryology, on diet, *Kitab al-Hawass al-agdiyah*,

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: ebmryology, 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 humam dissection by himself,

eye, nervous system, brain arteries and their branches <u>(circle of Willis)</u>, cardiac innervation, recurrent laryngeal nerve, innervation of alimentary tracts,

e. Ali ibn Abbs 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,

Avicena),

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

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Fig 5 Page fom 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 me movements, 6 extra-ocular muscles, trigeminal nerve,

Physician, philospher, 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,

Gland excretory duct obstruction, vertebrae, cerebellum, caudate nucleus, No nerves to liver, spleen and kidney,

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 Avicina 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

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 AD9....astronomy, magic Medical writing as much theological and political as scientific

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 drived from advanced animals.

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

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

دتاد المرشكاني المست وهذودما مدكوبنا وأبوت وذمست ستركم منتف ساست وخلك اددا أنَّان جت سوكر شدكر شابه توست وركان دوركاه كرانتها رمين بالكل بلاحظ كمندا نواسَّوْن لرندين فت فيندد كران الت كرشت ومان كرد فيت دود ونسروا فارخ اند نا برانك شامته است وخط مان ومشكل الست وخط مل ودنان كأذبان كماشاذا تشين مارد بالمجتان ومداسات الألمات سويددوكما ديكادية ويعددكا تسطاست مأصرل وندان بشرثناما ورباحيا متطيا ودوهد كوجك كردايشان سرداق تالدمت اوتلام سعا والغف ومعدد وأمار المحكف المبأدر وحاليت ولن زابرا كمناتكم ودحتين مزدواست صلابت ادميت ماقلت ذكم ت كريم ويتحل الله مادستان مدام مذو وهاندن فشلات وما برد وشكل ابرا ادا وادشلت ومرتم موف الاستا وارو مردمت ملوميد وكرمداد وكينة مراكد ومرد تكراع ماذى فادماخت وتشلات دراج اساداند شدد مكردد فروته المحدودة ومقاصل بساديات فلات فلانتقاب ودكراك هاكمانهم ودوشة أركالد حكت مت المرسمودنا ويركت فسادروفك مناسق برباء لافكال ودسادات وسنابرة خنسب كمازاذته خاطروات وأستماه ازله خاط درشه دارند کم انک در شب مردومان مدانته متعف قدوست وتؤريا أدعنك ملتف وشعيدون فلكأوس والرام اما در د مردد در زیری کر دیک دان ایر سامت دو کمن م دورد مان مرکد بالادونية ددوراج يدونا برعان المواد ولأعولون والزئيب محذن أشعوه ورباعتن صيتقلوه دونامسجت كمرداد تدبلات فالزاء جهت طرسي فباللاصفي بالأباشاد واستا تراشر جذجت مرجيبهم و ديسودا فوظن وزايده غملا است براطنان ومتراز امراي كم يسر دارنداما امزاس ··· الأشان سرشعة دارد ماهما، وآغاثنا غير - جدود مد را شدكر ديدان خلار ش وسواليزي إزملامت وتنعو وليستائق فترات ان لتروآست كدومانات سردا توبودكما ودان كدود ومركسا وشان فدا شدنها والشكر خان ستلو مرشل سكرد ووكان تقرود بعذ إذمره من مكدكر مصل كردديم تاجب اسكام شردواين ديستر جاد بالمدود

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,

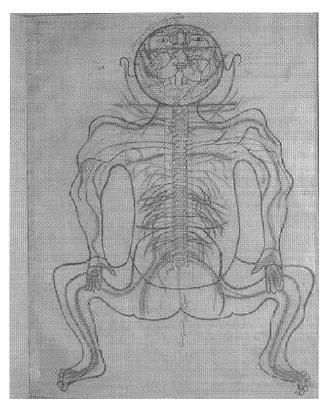
Tashrih-I Mansuri= Tashrih-I Badan Insan: Persian,

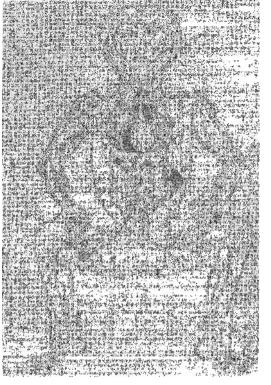
seven sections: Bones (Fig. 11), Nerves (fig. 9), Muscles (fig. 12), Veins (Fig. 10),

arteries, fetus, organs, human embryology(unique)... many color ilustrations: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)





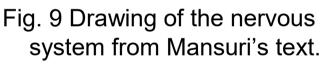


Fig. 10 Drawing of the venous system from Mansuri's text.

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

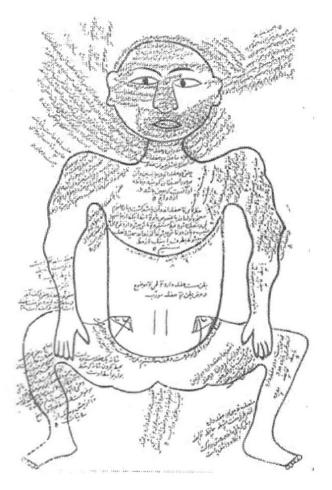


Fig. 12 Drawing of the named skeletal muscles from Mansuri's text.

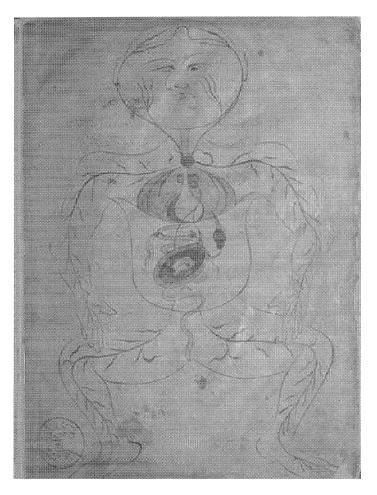


Fig. 13 Drawing of a pregnant Female from Mansuri's text.

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,

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, 13th- 19th centuries (next page table 2)

Book	Author	Year/century (AD)	Comments
Tashrih: Mokhtasari dar ImI	Abi al-Majd	13th century	a Persian anatomical book in two sections on
(Anatomy: A Synopsis	al-Tabib		simple and compound organs
of Science)	al-Bayzawi		
Ganooncheh	Mahmud ibn	14th century	a handbook of medicine. The second chapter on
(Handbook of the Canon)	Mahammad ibn Omar		anatomy was acquired from Joveini, Avicenna,
	Chaghamini	a —a to province constant	and Jorjani. The author was from Khwarazm.
Arjozat fi Tashrih-i Badan	Rashed ibn Amireh Sani	~15th century	a summary of human anatomy
(A Treatise on Human Anatomy)			
Tashrih al-Sadr	Unknown	1632	in Arabic and includes Hellenic and Islamic
(Anatomy of the Thorax)			interpretations
Tohfat al-Mumenin	Mohammad Mumen	1656	mostly on medicine and pharmacology and
(Gift of Mumen)	Hussaini (Hakim Mumen)		includes two illustrations for the body
	575 m		vasculature and bloodletting
Tashrih al-Maa	Unknown	1684	in Persian and about the anatomy and
(Anatomy of the Gut)		2020202	diseases of the alimentary tract
Tadbir al-Abdan	Abdolmonaam ibn Abdollah	1685	on medicine, with a brief anatomical review.
(Body Science)	al-Aziz al-Ameli al-Maftuni		The original text is attributed to Imam Reza,
			a Shiite Imam in Mashhad
Atabakyeh	Unknown	1779	written in three chapters on ophthalmology
			The first chapter includes the anatomy of the eye
Mersad al-Tashrih	Timur ibn Muhammad	1840	in Persian and dedicated to Mohammad
(Research in Anatomy)	Vali Mirza		Shah Qajar and deals with the anatomy of
			body articulations and simple organs
Merat al-Akvan Moludiyeh	Timur Mirza	1840	in Persian and dedicated to Hadji Mirza
			Agasi and contains a traditional discussion on
			human embryogenesis
	Ali Mohammad	1888	on the anatomy of the genital organs,
	Tabib Isfahani		embryology and obstetrics. Includes Persian
	Calendaria and 21 March Conne		equivalents of western terminology
Tashrih	Ali ibn Abd al-Jalil	1879	Translation of a French book, includes
(Anatomy)			musculoskeletal structures and embryology.
			The author is a graduate of Dar al-Funun

Table 2 Several anatomical manuscripts from Persia dated between the13th and 19th centuries

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

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

<u>Hadji Baba</u> 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)

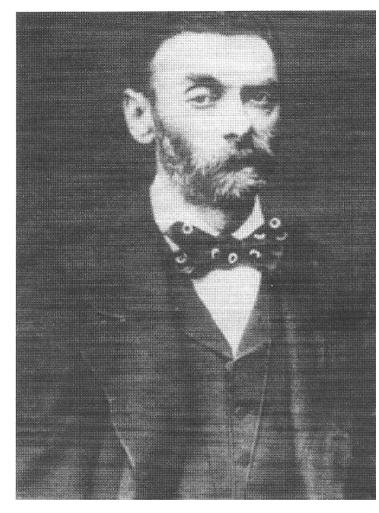
Mirza Tagi Khan Amir Kabir; the prime Minister of Naser-ad-Din Shah Qajar,

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 20th and 21th 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)

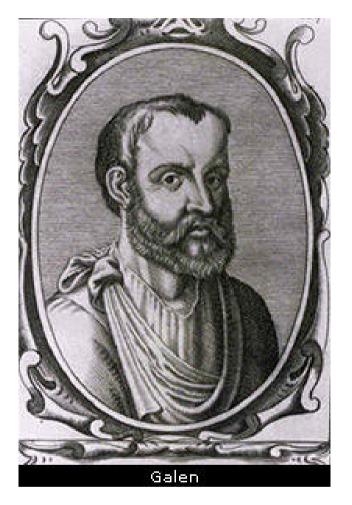
Graduated from Teh. Univ., studied anatomy and surgery under an American Surgeon, Dr. Bler, established first anatomy room at Teh. Univ., went to Mashhad to Stablish medical school and 2nd dissection hall, PhD. programme in anatomy, 30 ys teaching anatomy,was remembered as the father of modern anatomy. He discoverd 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 Institude, 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

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

To NEXT PAGE

Anatomy in the Age of Enlightenment



Andreas Versalius (1514-1564)

From Belgium

neteneracias

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