

# VETERINARY PHYSICIANS IN THE ISLAMIC WORLD OF THE MEDIEVAL AGE

## ORTAÇAĞ İSLAM DÜNYASINDA VETERİNER HEKİMLER

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### Summary

According to Islam, human being is the most honorable of all creatures. God created human perfectly and blessed him with his own soul. All the angels prostrated to show their respect and God assigned human being to represent Him on Earth. Everything on Earth and skies serve to him and finally he is responsible for building up the world and protecting it. Animals are also the responsibility of human beings. Prophet Muhammed suggested treating animals gently and respecting their rights, which proves that animals are under the protection of human beings according to Islamic traditions.

The necessity of protecting the animals and plants to ensure the sustainability of natural balance and the idea that animal health and welfare are inseparable have an important place in Islamic thought. Accordingly, examination of animals as a requirement of above mentioned thoughts –but not only for the purpose of benefitting from them but also learning more about their nature in order to carry out human being’s responsibility as perfectly as possible – has been considered essential in Islamic civilizations and animal health has been given special attention throughout Islamic history.

In Islam countries, many studies were conducted and books were written about veterinary medicine between 9th and 15th century. Under the light of this knowledge, the current study aims at presenting information about veterinaries who lived in Islam World during the Middle Age and their scientific works.

Key Words: Islamic World, Medieval Age, Veterinary Physician

### Özet

İslam inancına göre insan, yaratılmışların en şerefliisidir. Yüce Allah onu en güzel şekilde yaratmış,ona kendi ruhundan üflemiş, melekleri ona secde ettirmiş, yeryüzünde kendisinin vekili kılmış, yerde ve göklerde bulunan her şeyi, bu arada hayvanları onun hizmetine vermiş, yeryüzünün imarını ve emanet görevini de ona vermiştir. Hayvanlar da insana verilen bu emanet içerisindeyedir. Hz. Peygamber(sav.)’in hayvanlara şefkatle muamele edilmesine ve onların hukukuna riayet edilmesinin gerekliliğine dair tavsiyeleri de bize emanet edildiklerini açıkça göstermektedir.

Doğal dengenin sürdürülebilir kılınması için insan, hayvan ve bitkilerin korunması gerekliliği ve bu bağlamda hayvan sağlığı ve refahının birbirinden ayıramaz olduğu fikri İslami düşüncede önemli bir yere sahiptir. Bu düşünce doğrultusunda hayvanların incelenmesi, ancak sadece faydalanılmak için incelemek değil aynı zamanda mahiyetlerini daha iyi anlayarak kendilerine verilen görevi de layıkıyla yerine getirebilmek için araştırılması İslam medeniyetinde çok önemli bir yer işgal etmiş, hayvanların sağlıklarına büyük önem gösterilmiştir.

İslam ülkelerinde 9. ve 15. yüzyıllar arasında veteriner hekimliği konusunda çeşitli çalışmalar yapılarak eserler ortaya konmuştur. Bu bilgilerin ışığında çalışmamızda ortaçağ İslam dünyasında bu alanda uygulama yapan örnek hekimler ve eserleri hakkında bilgiler sunulması amaçlanmıştır.

Anahtar Kelimeler: İslam Dünyası, Ortaçağ, Veteriner Hekim

## 1. Introduction and Purpose

The Islamic belief sees mankind as the most dignified of all the created beings. Allah created human beings perfectly, blew the breath of life into them from his own soul, had all angels grovel to them, rendered them as his representatives on Earth, put everything on Earth, including animals, at their disposal, and trusted them with the Earth. Animals are also trusted to human beings. Prophet Muhammad's (s.a.v.) advices that we should treat animals affectionately and respect their rights also indicate clearly that they are trusted with us (1).

According to Islamic thought, protection of wild life and the natural balance is obligatory. It is of particular importance in the Islamic thought that there is a need to protect human beings, animals and plants as a whole and that animal health and welfare are inseparable components in order to ensure the sustainability of natural balance. In that vein, in the Islamic civilization, it has been very important to examine and research animals, not only for taking advantage from them but also for understanding their nature, and animal health has been one of the main concerns (2, 3).

The veterinary medicine, a medical branch focusing on the protection of animal health, treatment of diseases and injuries, increase of productivity, etc., was performed by the nomadic Arabs in the pre-Islamic period. They were able to treat many diseases skillfully, including mange, plague, dysentery, rabies, glanders and some neurological and eye diseases of horses and camels. However, there are no written evidence dating back to the Age of Ignorance (*Cahiliye*) and early years of Islam, where many veterinary physicians such as *As b. Vail* lived (4).

In Arabic life, camel was regarded as a strong animal adapted to desert life, from whose meat, milk and power human beings take advantage; and horse was regarded as a brisk and fast animal used for riding. Owning a horse was the indication of superiority and wealth. The nomadic Arabs, starting to settle over time, gave more importance to horses as a result of needs and acceptable values of the age. Thereby, the kinds of horses as well as their care and treatment were among the major issues of the age. Furthermore, the Quranic verses (Al-Anfal 8/60; An-Nahl 16/8; Al-Adiyat 10/1-5) (4) and hadiths (Abu Davud, Jihad 44, (2544); Nesai, Hayl 3, (6,218, 219); Buhari, Jihad, 43, 44, Humus 8; Muslim, Imaret 98, (1873); Tirmizi, Jihad 19, (1694); Nesai, Hayl 7, (6, 222)) (5), praising the use of horses in warfare, urged horse riding and breeding. That is why the main field of interest of the veterinary medicine had been horses until recent centuries; the majority of research focused on horses while the other animals drew less attention. The fact that horse was seen as an important means for attack and defense in wartime not only increased the value of horses but also caused the profession of veterinary medicine to develop under the control of the army. Muslim physicians and pharmacists started examining horses to use their experience in veterinary medicine and human treatment (4).

The ninth century is of particular importance in the Islamic world in terms of the development of science. In that century, the Islamic renaissance and the translation of books written in other languages gained acceleration. Scholars from all fields of study were encouraged to produce works (particularly by the Abbasid Caliph Al-Ma'mun) (4,6).

As from the 9<sup>th</sup> century, science in the Islamic world developed beyond but based on the Greek, Indian and Persian civilizations, which had already made considerable progress in

science. In the history of science, the Islamic civilization first comes to mind when the ninth century is concerned. “Although the Carolingian Renaissance was emerging, it was not powerful enough to compare with the scientific movements in the Islamic world,” says Sarton. The author explains the reason for this as follows: “The West gradually lost its interest in the ancient Greek sources. Thus, they had to research and rediscover slowly even the results obtained previously in the Greek world. As a matter of fact, in contrary to the general view, the Greek science did not develop rapidly, but reached a high level after many centuries. We do not know how long the anonymous phase of preparation lasted before science developed considerably.” However, the Islamic Renaissance was a glorious continuation of the advancements achieved previously in various parts of the world. That is why, the age of Islamic civilization had absolute superiority in science for over four centuries.

Veterinary medicine reached a higher level, compared to the West, together with biology and medicine, based on the previous knowledge. According to Leclainche, from the 5<sup>th</sup> century to the 12<sup>th</sup> century, veterinary medicine in Islamic countries had one of the most brilliant ages of the history (6).

In Islamic countries, various studies on veterinary medicine were conducted, and works were produced from the 9<sup>th</sup> to the 15<sup>th</sup> century. In the light of these preliminary remarks, this study intends to present information on influential veterinary physicians that performed in the Islamic world in the medieval age and their works.

## **2. The Source of Information on Veterinary Medicine in the Islamic World**

The Muslims generally acquired information about the world of animals through three traditions, i.e. Arab, Indian-Persian, and Greek-Alexandrian; and the zoological tradition of the Islam developed integrating with these three different traditions. The first relevant texts in Arabic focused on the issues of language and lineage in animals (7). There are poems particularly about horses and camels, used for transportation purposes. However, until the works written by Al-Asma’i and Abu Ubaidah, the Arabs did not collect and present the relevant information in written form. Al-Asma’i and Abu Ubaidah, the first zoologists of the Islamic civilization, produced their works by translating the oral tradition into written products. Although the succeeding zoologists made use of other resources, translated works and original observations, the knowledge and stories provided by the oral tradition had maintained their importance for the Arabic zoologists (8).

Another source of the Islamic zoology was the books translated into Arabic. Among the first translations were the works of Indian origin, including animal tales. For instance, *Kalilah and Dimnah (The Fables of Bidpai)*, translated from Indian into Arabic by Ibn al-Muqaffa (died in 759), was a work involving fables related to animals. The fables were written not only to learn about animals (e.g. their kinds, anatomies, etc.) but to learn from them and to research animals as beings that participate in the ultimate destiny of human beings and teach human beings considerably about the wisdom of Allah and their duties on earth (7).

Then, ancient Greek works were translated as from the mid-8<sup>th</sup> century. Important sources about zoology such as Aristotle’s treatise about animals and Galen’s works were translated into Arabic. A pamphlet about zoology written by Hippocrates, Aristotle’s *Historia Animalum* translated into Arabic by Yahya Ibn Al-Bitriq, a pamphlet about

animals written by Theophrastus of Eresos and *Sirr al-haliqa* (The Secret of Creation) by Apollonius of Tyana were some other works translated. In this age, many books about other fields of science were also translated into Arabic. The majority of translations into Arabic were from the Ancient Greek, but there were also some others from later periods. Scientific developments gained acceleration in the Islamic civilization with the effect of both the Arabic oral tradition and translated works. Using the translations, Islamic scholars started making additions and criticisms about available works, on the one hand, and producing original works, on the other hand. These works were consistent with the religious culture and knowledge established by Islam (8).

### **3. Veterinary Practices, Veterinary Medicine and Works**

#### **A) Linguists and Their Works**

The works produced in the 8<sup>th</sup> and 9<sup>th</sup> centuries were of importance in terms of lexicology. The description and comparison of desert animals, which were important in the pre-Islamic Arabic literature caused the development of an extensive vocabulary regarding the names and qualifications of these animals. In addition to this vocabulary, the observational information on these animals from the daily life of Arabs led to extensive knowledge. Many linguists attempted to collect in a book the extensive vocabulary and knowledge. Among these scholars were Abu Nadr Ibn Sumeyl, Abu Hatim al-Sijistani, Ebu Sa'id al-Sukkeri, Sabit ibn ebi Sabit, Sa'dan ibn al-Mubarak, Ya'kub ibn al-Sikkit, Hisam ibn Ibrahim al-Kirmanî and el-Asmaî. (7,8,9)

#### **1. Al-Asma'i**

Abu Sa'id Abd al-Malik b. Quraib al-Asma'i was one of the most preeminent scholars in that age. Al-Asma'i was born in Basra in 740 and died in 828. This scholar, whose most significant work was *Kitab Halak el-Insan*, was a great philologist, a highly talented poet and an expert in Arabic language and grammar. Among his many books about animals were the Book of the Horse, the Book of the Camel and the Book of the Wild Animals. In addition to the works each dedicated to an animal, he wrote *Kitab al-Vuhus* (the Book of Animals), where he told the characteristics of the donkey, ox, gazelle, mountain goat, ostrich, lion, wolf, jackal, fox and rabbit (8).

#### **2. Al-Jahiz**

His full name is Abu Uthman Amr ibn Bahr; Jahiz is a nickname meaning "cross-eyed". He was born in Basra probably in 776 and died in 868/869. He lived in Bagdad and Samara for long years. Among his teachers were preeminent scholars of the age such as Al Asma'i, Abu Ubaydah and Abu Zeyd. It is known that, in addition to many original treatises, he worked on translations from Greek. He was a very enthusiastic reader and communicated with and received information from all segments of people in Basra, including sailors, travelers and nomads. By doing so, he familiarized himself with many products of the oral tradition, including stories and idioms. Affiliated with the Mu'tazila school in terms of politics and religion, Jahiz wrote on politics and religion as well as science. His hundreds of works focus on various subjects; however, he also has works dedicated to a single subject. The majority of his works have not reached our day. Among his works are *On the Lion and Wolf*, *On the Mule and Its Benefits*, *Dogs*, *Cereals Dates*

Olives and Grapes, Minerals, Human, On the Difference between Human Beings and Jinns, Medical Criticism, Against Alchemy, and Countries (10).

His most important and probably most comprehensive work is *Kitab al-Hayawan* (*Book of Animals*), which consists of seven parts. The book is not a systematic work on zoology, but an entertaining literary work on certain animal groups. The book does not include information on all animals that Jahiz knew about. He only told about large mammals, some important birds and insects. The stories and information in the book not only reflect the knowledge constructed in the pre-Islamic Arab community but also make references to Islamic authors, Aristotle's *Historia Animalium* and other Greek scholars. In *Kitab al-Hayawan*, Jahiz categorizes, though in a simple way, animals by the type of movement, nutrients and physical appearance. This categorization is a simplified analogy of Aristotle's categorization. Jahiz categorizes animals as walking, flying, swimming and creeping animals; carnivorous and herbivorous animals; dog-like, cat-like and ruminating animals. He classifies birds as predator, vulnerable and small birds. There is no classification of fish in *Kitab al-Hayawan*.

In Jahiz's approach to zoology, animals are not classified as harmful and useful because for him every being was created to fulfill a function in the design of the universe. Jahiz was also interested in issues such as animals' adaptation to their environment and spontaneous emergence of some animals (for example the emergence of frogs from ice). For him, human is a micro-universe that bears the characteristics of many animals. While writing his works, Jahiz did not take for granted the knowledge provided by previous scholars, but added his own ideas and observations (11,12).

### **3.Ibn Kutayba**

Abu Muhammad Abd Allah b. Muslim al-Dinawari, also known as Ibn Kutayba, was born in 828 in Bagdad or Kufa in Iraq and died in 884 or 889 in Bagdad. Little is known about his family and life. What is only known about his family is that they came from Merv; that is why they may be of Persian or Turkish origin. Ibn Kutayba worked as a qadi in Dinawar before settling in Bagdad and becoming a teacher. He was a philologist and encyclopedist (13).

His most significant work is *Uyun al-Akhbar*, consisting of ten parts. The topics dealt with in this book are as follows: (1) State Administration, (2) Warfare, (3) Nobility, (4) Disposition and Ill Conduct, (5) Wisdom and Exposition, (6) Asceticism, (7) Fraternity (Friendship), (8) Needs, (9) Food, and (10) Women.

When writing this treatise, Ibn Kutayba did not make use of original observations or research. While collecting the information in the work, he had resort to the Arabic oral tradition and quoted Al-Asmai and his professor Abu Hatim al-Sijistani. Another scholar that he quoted in his work was Aristotle.

Although there are some similarities between *Uyun al-Akhbar* and Jahiz's *Kitab al-Hayawan* and some parts of the former has exactly the same word order in the latter, it is not possible that Ibn Kutayba referred to *Kitab al-Hayawan* as a source of information. For, Jahiz is not quoted in his work. The similarity probably derives from the fact that both authors made use of the same resources and the Arabic oral tradition. Another source

that Ibn Kutayba used in his work was the *Quranic* verses and hadiths. The *Bible* and the *Old Testament* were also used as sources of information.

Ibn Kutayba's writings about zoology are in the fourth chapter of *Uyun al-Akhbar*. This chapter comprises 35 parts. The first 10 parts are about human and human behaviors, and the succeeding 12 parts are about various animals and their relations with each other. Then follow the parts about plants and stones, and the final part is about jinns. The author divides animals into three main categories in his work. (1) Large land animals: a) domestic animals, b) predacious animals, including dogs, c) wild animals (rabbits, monkeys, bears, etc.), and d) ostriches. (2) Flying animals: a) predacious birds, b) birds feeding on seeds, c) birds feeding on seeds and insects, and d) bats. (3) Creeping animals: a) small rodents, b) snakes, c) frogs, d) lizards and turtles, and e) insects and scorpions. What is interesting is that no aquatic animals were mentioned in the book (14).

#### **4.Ibn Wahshiyya**

His full name is Abu Bakr Ahmad Ali ibn al-Muhtar. Ibn Wahshiyya, born in Kufa around 860 and died in Bagdad around 935, authored a great many of works. Most of these works are books translated from the ancient Babylonian and Arami languages into Arabic. Among the subjects dealt with in these books are sorcery, alchemy, astrology, physics, medicine, pharmacology, botany and agriculture. He also has a work on toxic substances and antidotes. His most significant work is *Kitab al-falaha al-nabatiya (the Nabataean Agriculture)*. In this treatise, the author provides valuable information on plant cultivation and animal breeding (8).

A series of encyclopedic works, which offer comprehensive information on animals, was written as from the late 13<sup>th</sup> century and early 14<sup>th</sup> century. This period was the start of a highly active period throughout which influential works on veterinary medicine were produced.

#### **5.Al-Qazwini**

Zakariya ibn Muhammad al-Kammuni al-Qazwini was born in Qazvin in 1203 and died in 1283. He left quite early the city where he was born. He settled in Damascus, and lived under the influence of Ibn Arabi. He worked as a qadi in Wasit and Hilla during the reign of the final Abbasid Caliph Al-Musta'sim (1241-1258).

He authored two significant works. One of them is a cosmographical work written in 1263 entitled *Aja'ib-ul-Makhluqat wa-ghara'ib al-mawjudat (Marvels of Created Things and Their Singularities)*, and the other one is a geographical work entitled *Aja'ib al-Buldan*.

*Aja'ib-ul-Makhluqat wa-ghara'ib al-mawjudat* consists of three parts. The first part deals with celestial things, the second part with terrestrial things, and the third part with animals. Al-Qazwini categorizes animals in *Aja'ib-ul-Makhluqat*. The categories in his system are (1) human beings, (2) beasts of burden, (3) ruminants, (4) predators, (5) birds, and (6) creeping animals. Aquatic animals constitute another category. Just like the other works of the Islamic zoology based on the oral tradition and ancient treatises, *Aja'ib-ul-Makhluqat* involves imaginary animals and unrealistic information (15).

#### **6.Al-Qazwini (2)**

There is another scholar known as al-Qazwini in the Islamic world of science. Born in Qazvin in 1281-82, Hamdollah ibn Bakr ibn Hamd al-Mostowfi al-Qazwini was an encyclopedist of Persian origin. He was charged with financial issues by the Vizier Rashid-al-Din during the reign of the Mongolian Khanate. Thus, he had the chance to visit many Muslim cities. In all cities he visited, he read books and conversed with scholars.

His first work is a history book known as *Tarikh-i guzida*. His second work is *Zafar-Nameh*, which has the nature of a sequel to Ferdowsi's influential work *Shahnameh*. He also authored *Nozhat ol-Gholub*. The introductory part of *Nozhat* presents information on celestial things, the earth and seasons. The main body is divided into three parts. The first part is about minerals, plants and animals. The second part focuses on human, human anatomy and human ethics. The third part provides information about geography.

Al-Qazwini divided animals into three groups: animals living on land, animals living in water, and flying animals. He further categorizes animals living on land into domestic, wild, predacious, toxic and creeping animals. *Nozhat* presents information about 288 animals. Some of these are imaginary creatures. The majority of information provided was not confirmed to be accurate by observations of the author, but previous information was used virtually. That is why, for example, we can read in the book that there are no joints in the legs of elephants. In the book, the animals are sorted by alphabetic order according to their names in Arabic. The name in Arabic is followed by, if any, a second name, and then by their correspondent in Persian, Turkish and Mongol languages. After providing information about general characteristics of each animal, the author explains drug production from certain parts and organs of these animals. The explanation related to drug production is too long for some animals. On the other hand, only the names of some animals are provided without further information (8).

## **7.Ibnu'd-Düreyhim**

His full name is Ali ibn Muhammad ibn Abdul Aziz bin Fatih es-Sa'lebi. He was born in Mosul in 1312. He lived in Damascus and Cairo for his studies. Then he settled in Damascus. After being sent from Damascus, the scholar lived in Cairo and then returned to Damascus. He worked as a mudarris (professor) in Damascus before going back to Egypt. He was delegated as an envoy by the Egyptian Sultan en-Nasr Hassan, and died in 1360 after arriving the city of Kus. He wrote about various topics, and his work related to animals is *Kitabü Menâfi'ül Hayevân*. In this work, he wrote about various domestic and wild animals in addition to human beings. In addition to explanations, there are about 250 miniatures that illustrate the animals in a detailed way (16).

## **8.Al-Damiri**

Al-Damiri, the most preeminent zoologist of the Islamic civilization, wrote the first encyclopedia about zoology, 400 years before the Western scholars. He was born in 1341-4 in Cairo and died in 1405. His full name is Kamal al-Din Muhammad ibn Musa al-Damiri. His most significant work is *Hayat al-Hayawan (Hayat al-Hayawan al-Kubra)*. This great work, which is the product of long years of research, is the first encyclopedia written in the field of zoology. Designed alphabetically, the work provides concise information about each animal. Systematizing all previous knowledge, this work had become in a short period of time the most commonly used Islamic treatise following

Jahiz's book, and was translated into Persian and Turkish. Al-Damiri did not make a new classification of animals, but adopted a new approach to animals in terms of their philological aspects, religion and Islamic jurisprudence, medical benefits and uses in amulets and importance in dreams. *Hayat al-Hayawan* gained a distinguished place in the Muslim community in a short time owing to its comprehensiveness, combining religious, literary and scientific perspectives in a single work. Read by large masses to learn the wisdom of Allah and to get more familiar with the world of animals, the book was referred also to explicate the religious information about animals provided in Quran (7,17)

## **b) Veterinary Physicians and Their Works**

### **1.Ibn Ahî Hizâm**

It has been reported that Huneyn ibn Ishak wrote a work based on the studies of the Byzantine veterinary physicians. However, because this work does not exist today, it may be argued that the oldest work in Arabic about veterinary medicine and horse training is *Kitâbü'l-Hayl ve'l-Bayrata (The Horse and Veterinary Medicine)*, written by Yakub ibn Ahî Hizâm el-Huttali, who lived in the 9<sup>th</sup> century and was the horse trainer of the Abbasid Caliph Al-Mutawakkil. Ibn Ahî Hizâm may be of Turkish origin; the fact that Turks assumed significant positions in the Abbasid Palace and that they kept ahead of other nations in horse training support this possibility. *Kitâbü'l-Hayl ve'l-Baytara*, translated into Turkish before 1536 and used intensively by the Ottomans, consists of 30 chapters in addition to the introductory chapter. The introductory part details the importance of horses, the good deeds and benefits of horse breeding and horse grooming. The book then offers information related to the teeth of horses, qualities of good horses, apparels of horses, mules and donkeys, parts of horses, horse training, breeding of race horses, innate or acquired defects of horses, diseases seen in horses and the treatment of these diseases. The 30<sup>th</sup> chapter of the book is dedicated to the diseases and treatment of some other animals, ranging from domestic animals to camels, cattle and sheep. Ibn Ahî Hizâm has another book titled *Kitâbü'l-Fürussiye*, which is only about horse riding (*furusiyya*).

In succeeding ages, Yakub Ahî Hizâm was considered a great authority in the field of horse science and veterinary medicine, and influenced Ibnü'l-Avvâm and Bedruddin Ibnü'l-Münzir el-Baytar, who were leading researchers of the Islamic world in the medieval age (18,19).

### **2.Ibn al-Awwam**

He was a scholar of botany, who lived in Andalusia. His full name is Abu Zakariya Yahya ibn Muhammad ibn Ahmad ibn Al-Awwam Al-Ishbili. There is not much information about his life. It is known that he lived in the late 12<sup>th</sup> century and was originally from Seville. He is renowned in the world of science for his book *Kitab al-filaha* about agriculture. Not only in the Islamic world but across the whole world, this book was a main source of reference in agriculture in the medieval age. The treatise consists of 34 parts, the first 30 parts being about plants and the remaining four parts being about animals. The relevant parts present information about domestic animals, diseases and treatment of animals such as sheep, goats, horses, camels and bees, their breeding, and practical information on, for example, bathing or massaging animals.



The only handwritten copy of *Kitab al-filaha* is available at Escorial Library. The work was translated into Spanish by Josef Antonio Bangueri, and published in two volumes together with its original in 1802. In his work titled *Geschichte der Botanik*, E. Meyer provided a summary of *Kitab al-filaha*. The work was translated into French by Clément-Mullet (18,20).

### **3. Abu Bakr Ibn Bedreddin al-Baitar**

Abu Bakr was the greatest veterinary physician of the medieval Islamic civilization, who lived during the period of the Mamluk Sultan al-Nasir Nasir al-Din Muhammad ben Qalawun (1293-1341). Abu Bakr's father Bedreddin al-Baitar was also a veterinary medicine in the Mamluk Palace. Sultan Nasr's father Mansur al-Qalawun (1279-1290) was very fond of horses. He had a hospital constructed, which later become very famous. Turkish physicians were employed in the hospital. Qalawun's son Muhammad Nasir was fond of science and scholars, just like his father. He completed the construction of the hospital that started during the reign of his father. He attached great importance to animal breeding and agriculture. Abu Bakr served as the veterinary physician of the palace between 1298 and 1340. All statesmen in the Islamic world had passion for horses. Sarton explained this great interest in horses in the palace as follows: "Today, it is not possible to estimate and imagine the size of royal stables in old times, particularly in the Islamic countries. A couple of years ago (a couple of years before 1947), in my visit to Meknes in Morocco, I had a car ride in the stable, which is said to have housed 12 thousand horses and was constructed in the 17th century by Malay Esmaeil." Abu Bakr lived and produced his influential work in this atmosphere. This work was *Kamil'üs-Sinaatyn el-Baytara ve'z-Zirtika*, acknowledged also by the Western historians as the best work in veterinary medicine of that age. It is about veterinary medicine and *zirtika*. *Zirtika*, the plural form of *zartaka*, means animal training and other practices related to animals.

As Abu Bakr dedicated this book to Melik Nasir, the popular and well-known title of the book is Nasiri. Based on his father's and own experience, Abu Bakr comprehensively dealt with horses and horse breeding as well as veterinary medicine. This unique work, the most prestigious and reliable of the books on horses, also involves information on other animals such as sheep and cattle. The treatise consists of 10 chapters. The fifth chapter about veterinary medicine comprises 34 parts. Following the first part, diseases are categorized by parts of the body, starting from the head, and examined in a highly systematic way. What significantly indicates extensive scientific knowledge and wisdom of the author is that he identified the relationship between diseases and weather and seasons. The treatise also leaves the Western scientists behind, referring to environmental issues and the impact of environment on the spread of diseases, specifying the principles of preventive medicine and providing recipes for preparing food for horses. He also dealt with poisoning of animals, e.g. various causes of poisoning, treatment and ways of protection. Considered the summit of intellectual development in this field in the Islamic culture, the treatise also covers the progresses made before it was written and served as a source of reference for subsequent studies.

Abu Bakr holds a significant place in the history of veterinary medicine, showing that the veterinary medicine in the Islamic world was superior to the European region in the 14<sup>th</sup> century and producing a work that may be qualified as an encyclopedia of veterinary medicine. This influential work of the great scholar was first examined by the Western scholars through its translation into French by Perron in 1852-1860 (21).

### c) Translations

The translation movement that started in the Abbasid age in the mid-8<sup>th</sup> century made significant contributions to the development of medicine as well as veterinary medicine (22). The first translations were *Baytarnama*, one of the apocryphal works attributed to Aristotle, with its one Arabic version and many Turkish versions; *Kitab al-Baytara* by Theomnestus of Magnesia, translated from Greek into Arabic by Hunayn b. Ishaq in the 9<sup>th</sup> century; and *Kitab al-Baytara* considered to be written by Apollonius of Tyana, translated from Persian into Arabic by Sabit b. Kurre with the addition of a preface in the 9<sup>th</sup> century (4).

### Conclusion

In the Islamic Civilization of the Medieval Age, the studies and progress in veterinary medicine were not restricted to the works of the names mentioned here. There are many other relevant scholars and works.

In the Islamic Civilization of the Medieval Age, the studies on veterinary medicine mostly concentrated in the eastern Islamic world.

A general overview shows that the works written in that age were either encyclopedias that include general information or treatises that provide information on veterinary practices and animals with reference to in dream interpretation, sorcery or drug production.

Works such as Jahiz's *Kitab al-Hayawan*, Al-Damiri's *Hayat al-Hayawan al-Kubra* and Ibn Kutayba's *Uyun al-Akhbar*, dealing with the science of animals (zoology), dealt with issues such as the anatomy of animals, ways of reproduction, periods of pregnancy and incubation and use of organs in treatment (menafiu'l-hayevan), in addition to veterinary medicine.

A serious of encyclopedic works, which comprehensively deal with animals, were written as from the late 13<sup>th</sup> century and early 14<sup>th</sup> century. This was the start of a very active period where influential works on veterinary medicine were produced. These works served as a reference for relevant studies in Europe in subsequent periods.

In those years, the main subject of veterinary medicine was horses; the majority of studies focused on horses and other animals drew less interest.

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