

Chapter-05

CONTRIBUTION OF GREEK, PERSIAN AND ARAB SCHOLARS IN OPHTHALMOLOGY

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ABSTRACT

The study and treatment of eye problems is the focus of the medical specialty known as ophthalmology, which owes much of its development to the great thinkers of antiquity in the Arab, Persian, and Greek domains. These civilizations' unparalleled contributions have influenced the realm of ophthalmology in the modern sense, leaving a legacy that will go on and benefit. Numerous facts about the world. In this piece, we examine the remarkable contribution of the scholars of Greece, Persia, and the Arab world and their priceless contributions to the advancement of ocular pathology. Ophthalmology encompasses a number of significant ophthalmological topics, such as pathology, anatomy, physiology, illnesses, and medical interventions. Key concepts were accurately calculated, contrasted, and accompanied by the beliefs of contemporary ophthalmology (Tabatabaei et al 2014).

Keywords: *Ophthalmology, Greek, Persian and Arab: Contribution.*

1. INTRODUCTION

One of the most prominent specialties in medicine is ophthalmology, including theories regarding the development of the structure and function of the eye that are relatively new in older Western societies (Tabatabaei et al 2014). Throughout history the field of medicine has been marked by unusual advancements often driven by the contributions of outstanding mind from miscellaneous Civilization in the field of ophthalmology, the Greek and Arab civilization have played important roles in the laying the fundamental for our understanding and treatment of eye disorders. These old Civilization not only Discovered the study of ocular anatomy and diseases but also developed creative surgical techniques that continue to effect modern ophthalmology (Abudawood et al 2020). The eye surgeons of old used to do operations, dissect, create, and record their discoveries in textbooks (Al-Hassani, S.T. 2007). Despite the fact that their research was restricted to animal eyes because it was thought to be disrespectful to dissect human bodies, they made a significant contribution to the anatomy of the eye. Because of their efforts, the earliest images of the anatomy of the eye (ShaikhI, 2018).

2. GREEK, PERSIAN AND ARAB: CONTRIBUTION

The spectacular achievement of the Greek Civilization placed the foundation for modern ophthalmology. the famous physician Democritus, who lived in the 5th century BCA, was among the first to propose that vision was the result of light rays entering the eye. While this theory was speculative, it planted the seed of scientific inquiry into the field. However, it was the work of the celebrated Greek physician Galen (129-210 CE) that truly transformed the understanding of ophthalmology. Galen widely studied the structure of the eyes, discerning the distinction between the cornea and crystalline lens.

He also recognized the optic nerve as the passage for visual information to reach the brain, realizing its important role in the visual process, Galen's detailed anatomical examination laid the ground work for subsequent progresses in ophthalmology. The greatest Arab doctors of the Islamic era made significant advances in ophthalmology in the ninth century, building on knowledge passed down from their Greek forebears. The renowned Persian philosopher Al-kindi describes a wide range of illnesses and considers possible cures. One of the most influential figures in the history of ophthalmology is undoubtedly the Persian physician and philosopher Avicenna (980–1037 CE). His seminal work "The Canon of medicine" served as the definitive medical references for centuries. Inside this monumental work, Avicenna describe miscellaneous aspect of ophthalmology, including in eye anatomy, potential surgeries and treatments of eye diseases. The Persian polymath Al-Hazan (965–1042 CE), usually referred to as Ibn Al-Haytham, further expended our understanding of optics. His in-depth understanding of how light and reflection interact set the stage for accuracy in eye surgery and the creation of corrective lenses. Additionally, several popular words including conjunctiva, cornea, uvea, and retina were introduced by Arab physicians (Shaikh I, 2018). Between 870 and 1370 A.D., the Arabs created thirty textbooks on ophthalmology, of which 14 were preserved, 10 were written in Arabic, and 10 were authored by ophthalmologists; this article discusses a handful of these textbooks (Hirschberg, J 1905), (Frederick C.1985).

3. BUQRAT [HIPPOCRETES (460-377 BC)]

Hippocrates (460-377 BC) is called father of medicine. And ultimate famous physician of the old Greece, the first person to free medicine from all forms of religious belief and establish it as a science based on observation and case studies was Hippocrates. He is frequently characterized as the model of the ancient physician and the founder of situated or toward the west medicine, even though in modern terms we can say that he used both clinical and homeopathic directions. Hippocrates believed that an imbalance in the four humors—blood, black bile, yellow bile, and phlegm—was the cause of illness in the body. Consequently, medicine suggested reestablishing this equilibrium. Hippocrates believed that a doctor had to examine a patient, carefully note any symptoms, make a diagnosis, and then administer treatment (Farrington B. 2000), (*Edelstein L 1967*), (*Kiapokas MS 2003*), (*Temkin, O. 1991*), (*Jones, W. H.1868*). *Hippocrates* therefore established the foundations of clinical medicine as it is currently practiced (Farrington B. 2000), (*Edelstein L 1967*), (*Kiapokas MS 2003*). He popularized a number of words used by doctors in their work, such as trauma, sepsis, diagnostic, and therapy (Jones, W. H. 1868). He also explained the symptoms of a wide range of illnesses in a superstitious manner. Numerous conditions, including diabetes, gastritis, enteritis,

arthritis, cancer, eclampsia, coma, paralysis, insanity, panic attacks, hysteria, epilepsy, and many more, still bear their names in modern medicine. The latter disease was called 'divine' before Hippocrates, and a transition from him underlines his rational way of thinking: "Epilepsy is not more divine a disease than some different disease. People call it divine because they do not understand it (Jones, W. H. 1868). He gave scientific status to Unani Medicine usually and in fundamental facets in particular (Hassan S. M et al 2019). Hippocrates' outstanding contributions to the science of ophthalmology completed new records. His compilation *Kitabul Ain* an Arabic translation came during Abaasi era (760- 850 AD). *Jami ulKahhalin* translated by Hunain bin Ishaq (873 AD) arrange valuable facts on the Ophthalmology (Hassan S. M et al 2019).

4. HUNAYN IBN ISHAQ AL-ABADI (808-873 A.D.)

Bagdad, Iraq-born scientist Al-Abadi was the author of Ten Treatises on the Eye, or العشرمقالالتفصيلين. He authored the first Arabic academic systemic textbook on ophthalmology, which included the first known illustrations of the six muscles, the optic nerve, and the eye. Both Latin and English translations of the book exist. Apart from his knowledge and skills as a doctor and ophthalmologist, he was also the principal translator of medical, botany, and mathematical texts. Syriac was his native tongue, and he was also proficient in Arabic, Persian, and Greek (Wafai, Z. 2016), (Abudawood, G. A. et al 2020).

5. THABIT IBN QURRAHALHARRANI (823–900 A.D.)

The writer of Vision and Perception, or البصيرقوال, was Thabit. In the direction of the literature, Thabit described the first occlusive therapy for amblyopia or lazy eye. In order to strengthen the lazy eye by compelling the "ocular spirit" to engage in the lazy eye, he proposed closing the normal eye with a patch. This was a ground-breaking idea in ophthalmology (Frederick C.1985), (Wafai, Z. 2016).

6. MUHAMMAD IBN ZAKARIYA AL-RAZI (RHAZES)

One of the best and most influential Persian physicians was Muhammad ibn Zakariya al-Razi, well known as Rhazes in Western literature. He produced around 180 books and essays in several scientific subjects, drawing on his extensive knowledge of Persian, Greek, and Indian medicine as well as his own observations and discoveries (Najmabadi, M. 1996). One of these publications is his *Al-Hawi*, a 25-volume medical encyclopedia that was written in the 10th century AD. It is an assemblage of data gathered from various sources in addition to Rhazes' own beliefs and clinical experiences. In *al-Hawi's* second volume, which has around 400 pages, ophthalmology

is covered in detail. The first translation of this encyclopedia into Persian was started in 1989. In total, four volumes were released, along with a three-volume synopsis called Synopsis of al-Hawi (Tabatabaei et al 2014). Rhazes, Avicenna, and other Persian physicians' beliefs and clinical experiences juxtaposed their opinions with those of contemporary scientific ophthalmic research.

7. AVICENNA

One of the most influential people in the history of ophthalmology is undoubtedly the well-known physician and philosopher Avicenna (980–1037 CE). For centuries, the official medical references were derived from his seminal work, "The Canon of medicine." Avicenna discusses the anatomy, physiology, pathology, illnesses, and remedies of the eye in the chapter on ophthalmology of his well-known medical treatise Canon (Avicenna, H. I. A. A. 1880). Given that Avicenna lived approximately 80 years after Rhazes, he was likely familiar with Rhazes' writings and, as a result, their perspectives on ophthalmology were not much different.

8. AL-HASAN IBN AL-HAYTHAM (ALHAZEN)

Alhazen, a scientist from Basra, Iraq, is credited with writing the "Book of Optics" and is referred to as "The Father of Modern Optics." He lived from 965 to 1039 A.D. Al-manazir, also referred to as "Optic treasure," was the author of approximately 90 works, the majority of which were translated into Western languages (Unal, N., et al 2009).

Table-1: List of Books - Valuable Contribution on the Ophthalmology

S.no	Duration	Book	Author
1	720 AD	Kitabun fil Ain	MasarjowaihBasari
2	828 AD	Maqala fil Ain	Jibrail bin Bakhteeshu
3	857 AD	Kitabul Ain	Yuhanna Bin Masewaih
4	"	KitaboTarkeebul Ain	"
5	"	Chapters of Kitab Al Mushajjar	"
6	873 AD	Ilmul Ain	Hunain Bin Ishaq
7	"	AshrMaqalat fil Ain	Hakim Mohd Tayyab
8	"	Maqalatun Fit TadaulBilHadeed	"
9	893 AD	Firdaus Al Hikmat	RabbanTabri
10	925 AD	KitabulHawi	Zakariya Razi

11	"	Kitabul Fi Haiatil Ain	"
12	"	Risala fi Fazil Ain Ala Sairi-Hawas	"
13	"	Risala fi Adviatul Ain	"
14	"	Elajul Ain BilHadeed	"
15	941 AD	Maqala Fil Kohl	Ishaq bin Suleman
16	985 AD	Chapters of Moalijat-e-Buqratia	Ahmad Bi MohdTabri
17	994 AD	Kamilus Sana (Section)	Ali Bin Abbas Majoosi
18	995 AD	KitabulMeah (Section)	Abul Sahl Al Maseehi
19	1013 AD	KitabulTasreef	Abul QasimZahrawi
20	1037 AD	Alqanoon Fit Tib (Section)	Boo Ali Sina
21	"	Alisteesar fil Ilaj-e-AmrazilAbsar	"
22	1039 AD	KitabulManazir	Ibna Haytham
23	"	TazkiratulKuhhal	Al Bin EisaKohhal
24	1080 AD	Kitab fil Amraz Ain	Mansoor Bin Eisa
25	1222 AD	Tabqatul Ain	NajeebuddinSamarqandi
26	1248 AD	Kitab Al Mughni	Ibn-e-Baitar
27	1275 AD	Alkafi fil Kohl	Ibn-e-AbilMahasin
28	1259 AD	Nateejatulfikr Fi ElajilAmrazilBasr	Abu Fatah Alqaisi
29	1288 AD	Al Mohazzab Fil KohlelMujarrab	Ibn-e- Nafees
30	1495 AD [Weqayatul Ain Fil Ahwalil Ain	Nooruddin Ali Bin MohdAlmanadi Hassan S. M et al (2019)

9. CONCLUSION

Our knowledge of and approach to treating eye conditions have been greatly influenced by the priceless contributions made to the discipline of ophthalmology by ancient Greek, Persian, and Arab experts. These remarkable brains, ranging from Hippocrates and Galen to Al Razi and Alhezan, laid the foundation for contemporary ophthalmology. Their lasting legacy is proof of their significant influence on the field, even as we gain from their skills and expertise.

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