Islamic Art

Archaeological Evidence of Oil and Petroleum Derivatives in Ancient Iran (Elamites to Sassanid)

Abstract

Archaeological studies behold a significant position in the analysis and recognition of economic, social and cultural history in antiquity. The use of oil in Iran dates back to ancient times, in the meantime, archaeological evidence plays an important role in clarifying this issue. According to ancient Iranian sacred texts, the word oil is derived from the word *Penta* in the Avesta. The results of archeological excavations and the report of historians indicate that the inhabitants of the Iranian plateau have been familiar with oil since approximately seven thousand years BC. Thus, it is central to study the effect of oil and its derivatives on the cultural developments of ancient Iran in this specific period; hence, discovering and applying this natural raw material and its impact on the material, cultural, political, religious and economic effects of Iranian societies in this period is noteworthy study. The ancient period from the rule of the Elamites to the Sassanid period is an imperative part of the developments of ancient times, the study of how oil was used in this historical period can reveal important points about the use of oil in Iran. This research has been completed by a descriptive and analytical method and based on field studies and library resources. The method of data analysis has been qualitative and, in this regard, a historical approach has been used in data analysis. The results of studies show that oil was used for lighting, heat, mortar in buildings, bitumen ships, create decorative vessels and ornaments, treat diseases and many more usages. Most of the bitumen works obtained in Iran belong to the Elamites and Achaemenid civilizations.

Research aims:

١. A study of the history of oil use in ancient Iran.

٢. Study of the effect of oil and its derivatives on the cultural developments of ancient Iran Elamites -Sassanid).

Research questions:

١. From what period and using what technical methods were obtained in ancient Iran from the first archeological works and evidences of oil exploitation and its derivatives?

٢. The distribution and frequency of material effects of oil and its derivatives in which of the periods of ancient Iranian governments was more?

Keywords: Ancient Iran, Archaeological Evidence, Oil, Petroleum Derivatives

Introduction

Oil is one of the main and oldest energy sources in the world, and there is no accurate evidence of its time efficiency by humans. This precious fluid, which has been buried in the form of sediment for a very long period of time due to the accumulation and decomposition of organisms, has resulted in the decomposition of a black, gaseous fluid called oil. The use of oil is one of the cases that is always monopolized by industrial issues and less has been studied and researched on the subject of its applications in civilizations, especially in ancient times. However, research in this field shows that this valuable substance has been used not only in modern times, but also has been applied in ancient times in diverse parts of the world. Meanwhile, the land of Iran has unique characteristics due to its very rich oil resources. The study of the use of oil shows that in the prehistoric and historical period of Iran, the use of bitumen and natural oil was very common in the Middle East. It has a special composition that has been used to prevent water from penetrating a wide range of objects such as water pipes, boats, baths, seals and weapons; moreover, bacterial damage has even been used in the treatment and protection of organic and food materials in hot and humid environments, and it has been used to glue broken pieces of pottery, as well as mortar on bricks. In ancient Mesopotamia, due to the scarcity of wood and the consequent limitation of fuel, the use of this adhesive-like material was very common among the people due to its low melting point and saving on fuel consumption. Archaeological evidence shows that in the foothills of the Zagros in Iran, the production and transfer of bitumen has led to asphalt production technology and extensive economic activity. The Zagros folds, on the one hand, contained large amounts of oil, and on the other hand, a slow flow of bitumen flowed out of their faults, and archaeologists have found evidence that those reservoirs have been active for the past ٨,٠٠٠ years. Previous studies by archaeologists in southwestern Iran with the history of sediments related to the

fourteenth and third millennium BC, show that the raw materials of local reservoirs were used in the production of bitumen mortar and so far found traces of the use of Mesopotamian bitumen in Iran.

Regarding the background of the present study, it should be said that no independent work with this title has been written so far. However, works on the use of oil in ancient Iran have been written. A book entitled "Applications of Oil and Gas in Ancient Iran" has been written by Farshid Khodadadian (۲۰۱۰). In this work, the author has dealt with the origin of oil and the use of oil in ancient times. Another article entitled "Study of the status and applications of oil in ancient Iran" by Abtahi and Zamani (۲۰۱۳) has been written; in this article, the authors believe that oil and bitumen were used in ancient times in buildings, lining, lighting and heat, and in making utensils and treating diseases and wars. An article entitled "Application of natural bitumen in ancient Iran" by Zahedi (۲۰۰٤), the author has also mentioned the use of bitumen in dishes, seals, ornaments.

According to the purpose of studies, the present article is a kind of basic research and in terms of nature and method, historical-cultural. Our information in this research has been collected based on two methods (field study of museums) and documentary methods (library studies). The results of archeological excavations of people such as Herzfeld, Neghaban, Majidzadeh, etc. and the reports of historians such as Herodotus, Plutarch, Procopius, Amianus Marcellinus, Strabo, etc. have been studied and information from other sites has been collected based on published sources; furthermore, the analysis of the current research is qualitative. In this way, all areas from which oil and oil derivatives are obtained have been examined and all its applications have been stated.

Conclusion

The Ilam civilization, due to the existence of rich and abundant oil resources that flowed naturally on the earth, had a significant and active role in the use of oil and its derivatives and archeological findings confirm this. This phenomenon has also existed in the Mesopotamian region and evidence of these applications has been obtained in the known civilizations of this land. However, oil cannot be considered as one of the main reasons for the creation of civilizations in Iran and Mesopotamia; Nonetheless, it has undoubtedly been very effective in its flourishing and development. How is it that the civilizations of the Orient and the most prestigious of them were formed in regions where, in addition to soil and water, which were the alphabet of civilization, there was also oil and its derivatives? When we pay attention to the historical and archeological background of the region,

we find that the uses of oil and gas can be studied from mythological times, and there is a lot of evidence of its familiarity and use in the texts. In addition to the mythological implications of oil and gas applications, clearer references to the applications of this fluid have been found in religious texts. These references are mostly used to describe events and designate happenings, as well as the various uses of oil and its derivatives. In addition, as humans became more familiar with the new uses of this fluid, its products and uses increased. Tool making, manufacturing utensils and cylindrical seals are the oldest examples of bitumen discovered in Iran, which show the antiquity of this application. Embossed maps and sculptures and statues of bitumen or a combination of these confirm the widespread use of this petroleum material. In addition to the above, the use of oil and petroleum products in the form of ink has been used in ancient times.

Another aspect of the application of this valuable fluid in the life of the ancient Iranians as well as the Mesopotamian civilizations in terms of its usage in architecture. The anti-moisture and insulating properties of oil and bitumen have left behind many evidences in the ancient architecture of this land from the time of Ilam until then. Choghaznabil Ziggurat beholds the use of bitumen in Elamite architecture and then it is repeated in other Iranian architectural works. Iranian dam construction indicates another use of bitumen in insulation, the bitumen dam, the monument of Sassanid dam construction in Shushtar is the most obvious example. The religious applications of which we have evidence for oil and gas are perhaps some of the most important applications of this valuable fluid. Creating a blazing and permanent fire, good and abundant properties and heat, as well as low effort and cost in its preparation and accumulation, are among its most important points that have caused oil and gas to find a special and valuable use in religious affairs. Specifically, fire, due to its importance in the survival and development of ancient man, has been sacred for Iranian for prolonged ages and hence guarding and cherishing this valuable element has been considered in most religions and sacred places. Therefore, fire had a high status in the belief of Iranians and the factors that created and maintained it were equally significant. The medical applications of petroleum derivatives have also been momentous and this was not limited to the Iranians and many confirmations exist from China to Egypt. Bitumen and petroleum derivatives and their applications in the treatment of skin diseases, rheumatism, etc. all show evidence of such applications. Likewise, in one case, the use of bitumen to make artificial limbs can be observed. As seen in the “Shahr-e Sukhteh”, an artificial eye made of natural bitumen has attracted the attention of archaeologists from around the world. Oil and gas have long had various applications

of livelihood, industry, trade, religion, military, medicine and also architecture in Iran and this confirms the applications of this valuable fluid in various aspects. Oil was not the lifeblood of civilization in ancient Iran; however, it has had many applications in the development and overall progress of the rich Iranian civilization.

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