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BIRD OF FIRE: PERSIAN POWDER FLASK NO. 1662 IN GAYER-ANDERSON MUSEUM, CAIRO

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Abstract:

Museums, private collections, and auctions worldwide still hold various types of Persian powder flasks. For instance, Gayer-Anderson museum in Cairo boasts a distinctive collection of primer powder flasks. The museum's records for this collection are not accurate, especially regarding the acquisition circumstances and the objects' origins. Researchers previously identified and classified four types of Persian primer flasks in this collection. This research focuses on another rare Persian primer flask in the collection, resembling a bird's shape. Crafted from brass, the flask's bird motif is evident in the nozzle, depicting the bird's face. The body appears quite plump, encircled by a curved line. The tail is stylistically formed to resemble a pear's shape. Interestingly, the studied flask exhibits details that differ from those of similar bird-shaped examples found in other collections. The study adopted the descriptive, analytic, and comparative approaches, which revealed the object's uniqueness. It suggests that the object may be categorized as a fifth type, distinct from the four previously identified in the same collection.

1. Introduction

Various types of powder flasks dating back to different periods of Persian history have been traced. They mostly adhered to traditional Persian designs, while a few incorporated imported artistic influences. For instance, Gayer-Anderson museum houses a significant collection of Persian powder flasks, which were studied and published in 2018 [1]. The collection was classified into 4 types of Persian powder flasks according to the objects' shapes. However, another bird-shaped powder flask, which was different from the types in the same collection of Gayer-Anderson museum was found. There is no accurate information available concerning its origin or the circumstances of its accusation at the museum. The bird-shaped example of the Persian powder flask is rare in most known collections of this type, as illustrated by the few studies on the subject. Allan and Gilmour [2] conducted the first study, focusing on the bird shape of examples of Persian steel powder flasks. This study is almost the most relevant study that we could find. In a later short book in the same collection as the previous publication, Allan also referred to the bird shape style in other Persian artifacts [3]. The other examples of bird shape powder flask were found in some auctions and websites interested in antiquities and old arms and armors, such as "faganarms" [4], "bolk antiquities" [5], "ebay" [6,7], "vikingsword" [8], and "alamy" [9,10]. They were displayed but needed a much deeper study for re-examination. However, the bird shape of the current study's Persian powder flasks differs in its details and overall shape from the previously mentioned example, making it unique among its type and within the Persian powder flask collection in Gayer-Anderson museum. The current study suggests classifying this example of the bird-shaped Persian flask as the fifth type in this collection. Moreover, it aims to highlight the uniqueness of these Persian powder flasks in general and among similar examples. It aims to explore the relationship between the bird's form and its function as a powder flask.

2. Methodology

The research adopted several methodologies to describe and analyze the flask's components and shape. Additionally, the studied object is compared with similar examples in other collections to classify the studied priming flasks and identify the relationship between their forms and function.

2.1. *Description*

- **Type:** Priming flask.
- **Material:** Brass (Cu+Zn).
- **Technique:** Casting, soldering, and rivet.

- **Dimensions:** Length: 12 cm.
- **Weight:** 122g.
- **Registration number:** 1662.
- **Date:** 13th century AH / 19th century CE.
- **Production place:** Persia.
- **Publication:** Unpublished.

This brass primer flask takes the form of a bird. Its body inflates in the middle, tapering towards both sides in distinct shapes. The flask comprises two parts: The lower part, serving as the main vessel for the black powder, and the upper part, functioning as either a lid or a spring valve, fig. (1-a). The lower part consists of a conical body that tapers outward towards the sides, terminating in distinct ends. The front end forms the nozzle, shaped to resemble the lower mandible of a bird's long beak and chin. Then, the body curves downward, representing the throat and breast of the bird, albeit without detailed features. Finally, the body bends upwards at a wide angle before twisting sharply downwards at an even steeper angle compared to the curve of the front. This downward section terminates in a narrow, pear-shaped end, figs. (1-a, b & c). The upper part functions as a lid, fitting over the nozzle of the lower part to close it. The lid comprises a valve affixed to the top center of the flask. The valve is secured by a screw and sits atop a spring. Additionally, two screws secure the valve at either end. The first screw connects the front of the valve to the front of the main body, while the other joins it to a thin metal piece fixed at the top of the body. The spring valve terminates in distinct ends. The front end mirrors the shape of the lower part's end, resembling the upper mandible of a bird's beak. It also incorporates details, such as the nostrils, forehead, and crown, mimicking the upper portion of a bird's head, fig. (1-c). Notably, intricate details are present in the eye section, including the eye-ring, supercilium, and ear coverts. This section serves as the closing mechanism of the nozzle, replicating a complete bird's head, fig. (1-c). The opposite end features a triple-leaf terminal, possibly representing a bird's tail. Furthermore, a pair of suspension rings is situated at the valve's center-top for hanging, fig. (1-d). The primer flask is nearly devoid of ornamentation, except for three bas-relief rings encircling the pear-shaped base at the end of the body. Furthermore, decorative elements are primarily achieved through incision and carving. Geometric patterns of inclined lines adorn the valve's surface and accentuate the details of the bird's face and eyes. Interestingly, the overall design on the valve's upper surface mimics a stylized bird in reverse. The artist employed engraving to depict the bird's crown at the valve's front and the tail shape at its end. Notably, two movable metal rings are attached to the valve's top using rivets, fig. (1-d).

Figure (1) **a.** & **b.** both sides of the brass primer flask, 13th AH/19th CE, Gayer-Anderson museum, registration no. 1662, **c.** the holding method of the primer powder flask to fill in and pour the black powder, **d.** the engraved decoration at the top of the valve.

2.2. Materials

This primer flask is representative of a style commonly made of brass, as determined by visual examination. Similar examples include a primer flask in the Fagan Arms Collection, stock number A6742, dated to the 17th (11th AH) century, fig. (2-a) [4], and an engraved brass primer powder flask on the Bolk Antiques website, dated to the 18th (12thAH) century, fig. (2-b) [5]. Additionally, two brass primer flasks can be found on the eBay website, the second featuring its inlaid silver decoration(a), figs. (2-c & d) [6,7]. While brass is the most common material for this style of primer flask, exceptions do exist. For instance, the Tanavoli collection holds a bird-shaped primer flask (acquisition no. 428, 10.5×5 cm, 18th-19th CE/12th-13th AH) crafted from steel [2]. George Cameron Stone (1961) published a description of another bird-shaped primer flask made of engraved bronze [11]. Silver is sometimes used for decorative elements on the flask's body, as previously mentioned. However, a few rare examples exist entirely in silver, such as two primer flasks from the 19th (13thAH) century found on the Alamy website(b) [9,10]. Bird-shaped powder flasks were indeed crafted from various materials. However, brass alloy appears to be the most common choice, as evidenced by the previously mentioned examples attributed to Iran or Persian provinces. Persian provinces boast a long history of brass metalworking due to the abundant local availability of copper and zinc, the primary components of the brass alloy(c) [12]. However, Al-Khamis and Eremin [13] suggest that during the Qajar Period, the main sources of metals probably shifted. Imports from Russia, Britain, and Europe potentially supplemented, or even replaced, local supplies. Additionally, the recycling of older artifacts was practiced in some cases [13,14]. From the late 18th (late 12th AH) century onward, various political and economic factors made importing minerals into Iran more cost-effective than domestic mining. This trend likely coincided with the increasing control of Iran's mining industry by foreign companies, who would then transfer their profits out of the country by the late 19th (late 13th AH) century [14]. Brass was a popular material during the Qajar Period, favored for both royal and local productions [15]. Its appeal stems from its lustrous, luxurious appearance, which sometimes resembles gold. Additionally, brass is highly recyclable and reusable, and, importantly, it exhibits excellent corrosion resistance when storing black powder. These qualities likely contributed to the use of brass in the studied primer, suggesting a possible attribution to northeastern Iran. On the other hand, metalworkers diversified their production lines to compete with imports and meet the

demands of modernization. Typically, each group of artisans specialized in a specific craft, making it difficult to identify a dedicated group solely for metal powder flasks. Given their expertise in brassworking techniques, particularly casting, it is likely that the braziers (*dawat-saz, davatgar, ru'i-gar*) were responsible for producing brass powder flasks during the Qajar period. They likely collaborated with other specialists, such as brass finishers (*souhan-kar*) and polishers (*pardaht-kar*, *ferceh-kar*) [16], to achieve the smooth, shiny surfaces characteristic of most Qajar metalwork, as evidenced by the studied primer flask. While the exact composition of the brass alloy used in the studied primer flask cannot be determined, it was likely manufactured from the most common brass alloy of the time, containing 32-38% zinc [12,13].

Figure (2) **a.** primer flask, brass, collection of Fagan arms stock no. A6742, 17th(11thAH)century.(*After: https://www.faganarms.com/products/17th-century-persian-powder-flask?pos=1&_sid=08912be39&_ss=r*), **b.** primer powder flask, brass, bolk antiques website. (*After: https://www.bolk-antiques.nl/inventory/miscellaneous/a-very-nice antique-18th-century-eastern-islamic-turkish-persian-engr aved-brass-primer-powder-flask-length-135-cm-in-very-good-condition-price-550-euro-1238020*), **c.** primer flask, brass, Iran or *Turkey*, 18th c. (12thAH), eBay website by Antique Boutique Z. (*After: https://www.ebay.com/itm/255111991781?_trkparms*), **d.** primer flask, brass, Iran or India, 19th c (13thAH), eBay website. (*After: https://www. ebay.com/itm/ 204033361637*)

2.3. *Artistic analysis*

The tradition of creating bird-shaped objects has a long history in Persia, with Iranian artisans adopting it since ancient times. This tradition continued into the early Islamic period, as evidenced by numerous examples of early Islamic metalworks found in Persia. These objects, often censers or water flasks, were crafted in the shapes of birds or animals. The most famous examples of this type are Aquamanile vessels, typically shaped like birds or animals. This artistic approach was likely influenced by the lasting influence of Sassanian art [17], which heavily incorporated birds and animal elements into Persian art, particularly metalwork, as evidenced in numerous examples of Persian art throughout history[(d)] [18,19]. Allan [3] reported that the bird shape was adopted for other artifacts, especially padlocks with a multiple-spring mechanism, which were made in Shiraz. According to Attarzadeh [15], the production of bird and animal-shaped metalwork continued from the Safavid period into the Qajar period with minimal change. However, during the Qajar period, carved shapes became more common, likely due to the growing popularity of metal casting techniques. This trend could explain the pronounced curves in the bird elements of the studied primer flask. Furthermore, the smooth surface and lack of decoration on the flask's body demonstrated the evolving tastes of Qajar metalwork, fig. (1-a), which were influenced by European aesthetics. This influence can be observed in many Qajar metal vessels shaped like birds[(e)] [20], which could be observed in other material, for example, the bird shape at the top of a wooden crutch is dated to the Qajar period and to the town of Abadeh located between Shiraz and Isfahan in Iran, now at Victoria and Albert museum (Accession No. 858-1889) [21]. The dove is a prevalent motif in Islamic metalwork depicting birds, as it is significant in the story of the Prophet Muhammad's migration from Mecca to Medina with his companion, Abu Bakr. Additionally, doves and pigeons are believed to symbolize guarding the martyrs and messengers of God [22]. Allan (2000) argued that Persian craftsmen moved from naturalism to stylization and thence to abstraction, especially in the primer flasks [3].

2.4. *Comparison*

Bird-shaped powder flasks are rarely compared to other types, as evidenced by the limited number found before conducting this study. Some of these examples are in auction galleries and private collections, as previously mentioned. The key differences between these examples and the studied primer flask lie in the presentation of the bird's head and the relationship between the valve terminals and the nozzle of the container below. Due to these variations, it is difficult to definitively identify the specific bird species depicted in each object. For example, the valve terminal of the primer flask pictured on eBay, fig. (2-d) nearly depicts a complete bird's head with a long beak. The nozzle beneath it appears to echo the outline of the valve's head shape, as the entire arrangement of the nozzle and valve could be interpreted as a bird's head settling above the other and appearing as two birds on the nozzle. In contrast, the front terminal of a similar primer flask on the Vikingsword website depicts a bird's forehead, eye, and crown. The nozzle below it is longer than the valve terminal and forms the lower portion of the bird's head, including the lore. These features collectively resemble a dove, fig. (3-a). Additionally, the engraved decoration at the top of the valve is nearly identical to the one found on the studied primer flask. One example from the Tanavoli collection closely resembles the dove shape of the previous primer flask, with a few distinct details. The front terminal of the valve is extended to form an upper pointed beak that aligns perfectly with the nozzle's lower pointed beak at the flask's end. This design ensures a complete closure of the opening, allowing it to effectively represent the entire bird's head, fig. (3-b). The studied primer flask closely resembles the previous example from the Tanavoli collection, with a few key differences. First, the beak shape on the studied flask is round, and the upper and lower mandibles fit together perfectly. Second, the containers differ at the ends. The Tanavoli example has a narrow back resembling a bird's tail [7], while the studied flask has a narrow back with a pear shape. This bird's tail shape distinguishes the Tanavoli example from most others, as it presents a more complete bird form. Furthermore, the

mechanism for opening and closing the aperture appears to differ in the Tanavoli example from that in the studied flask and similar examples, probably due to the presence of an additional aperture at the narrow tail end. This aperture, likely closed by a regular screw, could have been used to fill the container with black powder. In contrast, the other aperture might have served to fill the rifle, fig. (3-b). Additionally, the Tanavoli flask incorporates more details to imitate bird wings through engraved slanted or curved lines on the body. Another example of a brass primer flask, 18th (12th AH) century, found on the eBay website, depicts the full form of a bird, fig. (3-c). It differs from other known examples of this bird type. In this case, the placement of the nozzle and the closing terminal of the valve are reversed, forming the tail rather than the head of the bird. Conversely, the bird's form is emphasized by engraved feather elements on the main body and nozzle of the object, fig. (3-c) [6]. The other known bird-shaped primer flasks differ significantly from the studied example. In most cases, one terminal of the container forms the nearly complete head of the bird, with engraved details like eyes and beaks. The aperture is often closed by a spring valve that matches the curve of the upper head, potentially representing a crown. Interestingly, interpretations of bird features vary greatly across these flasks. For instance, the two narrow terminals of the primer flask in the Fagan Arms Collection (stock number A6742) depict bird heads, with one serving as the nozzle. The entire body of this object is adorned with engraved lobed medallions, perhaps a stylistic representation of wings. Each medallion incorporates floral and human elements, creating a stark contrast to the undecorated simplicity of the studied primer flask, fig. (3-d). Another distinct example is the primer flask at Bolke Antiques. The nozzle section is shaped like a complete bird's head, but the details differ significantly from other types, resembling a peacock's head more closely. The body also features some engraved floral decorations, fig. (3-e) [5]. Similarly, the two primer flasks on the Alamy website share the bird-like shape of the Bolke flask, but they are crafted from silver [9,10].

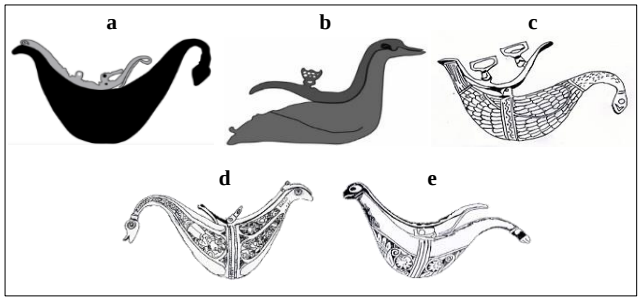

Figure (3) various presentations of the bird's shape of the primer flask at other collections, the general shape of a primer flask at; **a.** the Vikingsword website, **b.** Tanavoli collection, **c.** eBay website by antique boutique Z, **d**. the collection of Fagan arms stock number A6742, **e.** bolk antiques.

3. Results

The studied primer flask is unique in the shape of a bird in the other collection, and distinct from the four existing types studied before in Gayer-Anderson Collection. The previous study classified the primer flasks within the collection into four main artistic types: The first type is animal horns, the second type is crescents, the third type is musical instruments or mandolins, and the fourth type features a spherical body connected to a neck resembling male camel genitalia [1], so this primer flask could be classified as a fifth category. Bird-shaped primer flasks typically omit depictions of feet because feet wouldn't serve a functional purpose on this type of object, given the need for a streamlined shape to improve the primer flask's function figs. (1 & 4). Additionally, primer flasks were usually attached to the user's belt, eliminating the need for a base for standing. The Persian gunpowder industry traditionally employed two design patterns for bird-shaped flasks. In the first pattern, decoration is limited to the bird's head, which forms the front of the valve fixed on the container's surface. In the second pattern, the container's body integrates with the valve, allowing for the representation of most bird anatomy: Body, neck, head, and sometimes even the tail figs. (1 & 4). The center of gravity for this type is in the middle of the body, allowing for stability in the palm when holding it. Its dimensions, which are less than the average length and width of the palm of an adult man's hand, contribute to this stability at the tail fig. (1).

4. Discussion

4.1. *Type and form*

A previous study of Gayer-Anderson collection in Cairo classified the primer flasks within the collection into four main artistic types as mentioned before [1]. Based on the distinct form of the current study's primer flask, it is evident that it differs from the other primer flasks in the same collection, as it is shaped like a bird, even though it lacks a representation of feet. Allan refers to several examples of primer flasks in the Tanavoli collection (nos. A.23, 25, 26, 28). Some of these flasks incorporate a bird shape at the termination point of either or both valve ends, with the front valve typically featuring a bird head with a prominent beak (mandible). Allan further suggests that the spring valve design of these examples, dating to the 17th (11th AH) century, might point to Russia as the origin of this style of primer flask(f) [2]. An essential difference was observed between the type of primer flask mentioned by Allan and the type studied here. Most of the examples in the Tanavoli collection are shaped like angled horns, with the valve end resembling a bird's head in profile, except for example no. 28, in which the entire body of the primer flask, including the front terminal of the valve, forms the complete bird shape. Thus, the previous classification was based on the shape of the valve terminal, not the overall shape of the object. However, the current study proposes classification based on the object's overall shape. The bird type can be distinguished by three elements of the bird's form: firstly, the back end of the main body, which, in the studied object, tapers to a pear shape, resembling a tail. Secondly, the front end of the body, which is considered the bird's neck, ends with a protrusion like the lower mandible. Thirdly, the front terminal of the valve above the body completes the head of the bird, incorporating the eyes and upper mandible. Fur-

thermore, the engraved details at the top of the valve further emphasize the bird's form, fig. (4). All the artistic design elements work together to nearly complete the bird's shape on the studied primer flask, figs. (4-a, b & c). This contrasts with Allan's classification, which relies solely on valve shape.

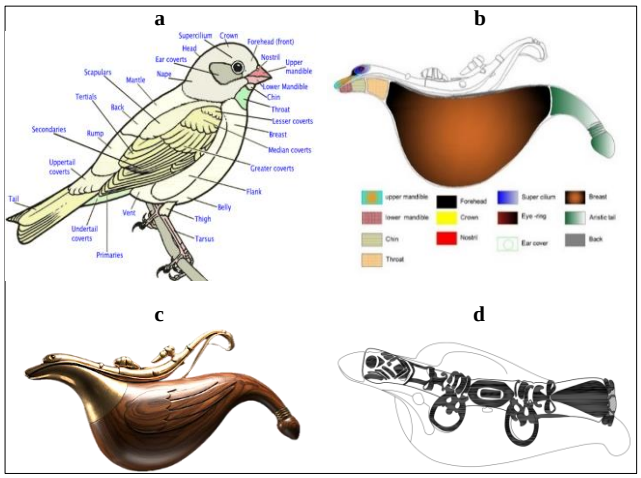

Figure (4) **a.** example of bird's anatomy, copyright©birding.in. (*After: https://www.birding.in/bird_topography.htm*) [23], **b.** The bird's details as could be traced at the studied primer flask, **c.** The bird's shape of the studied primer flask generated by AI Gemini program, **d.** The decoration details at the top of the valve.

4.2. *Relationship between form and function*

The bird shape seems to correspond to the main function of the primer flask to keep the black powder, on one hand, and to fill the rifle or a suitable kind of firearm, on the other hand. The studied primer flask is a good example of the harmonious relationship between form and function in several ways. Firstly, the brass material and small size (12 cm long), with a weight of almost 122g, make it easy to grasp with a single hand [24] fig. (1-c). This is particularly important considering the added weight it would carry when filled with black powder. Secondly, the bird shape helps hold comfortably, as the puffy midsection and streamlined, narrow ends provide a secure grip. Additionally, the shape of the bird increases the safety of the primer flask against any fire accident as the streamlined shape of the bird keeps the powder in the middle of the primer, which is the breast of the bird shape, far from the two ends of the primer until the powder is needed. Notably, the bird's face serves as the sole nozzle for both filling the flask and dispensing powder into the rifle, figs. (1 & 4-b). The primer flask incorporates a spring valve for easy opening and closing of the nozzle via thumb pressure. This valve effectively eliminates the risk of leaving the nozzle open. Both the process of filling the flask with black powder and dispensing the gunpowder are controlled by the spring valve and its associated screw. The screw securely connects the front end of the valve to the underlying nozzle, ensuring a tight seal. Furthermore, the nozzle features a narrow, tapered conical tip with a diameter smaller than the rifle barrel or its storage nozzle, allowing for smooth insertion and minimizing powder loss during the filling process, figs. (1 & 4-b). The back end of the primer flask features a significant downward extension at a sharp angle, which terminates in a small protrusion, designed to comfortably accommodate the index finger for gripping the flask. Notably, the spring valve's end sits entirely above this protrusion, allowing it to open with easy thumb pressure. Two suspension rings are fixed to the valve's top, enabling the flask to be hung from a belt, shoulder, or even around the user's neck. A tape, chain, or thick rope can be threaded through these rings, figs. (1 & 4-d).

5. Conclusion

The studied Persian primer flask at Gayer-Anderson collection, in the shape of a bird, is unique among the other types of primer flasks in the same collection. It features the form of the bird when compared to the other existing examples of bird-shaped primer flasks in the other collection, as it represents almost the full shape of the bird without the legs, its simple shape without any decoration, and the streamlines of its lines enhancing the bird shape in comparison with the similar primer flasks. Regarding its unique form, it could represent the fifth category, adding to the four previously studied types of powder flasks in Gayer-Anderson Collection. The studied primer flask refers to the diversity of shapes and types of this type in Persian territories. The examination of its parts emphasizes the correspondence of its bird shape to its function as a powder primer flask. It denotes the continuity of the bird shape in the metal works in Persia regardless its functions, and the ability of the Persian artisans of making harmony and balance between form and function, especially, the primer flask which needs good measurement to make the balance between the size of the primer flasks, it weights, the amount of the black powder which would fill in, and the person who would carry it and use it to fill its rifle. The paper emphasizes the importance of studying and documenting the large number of Persian powder flasks in Egyptian museums and special collections, which could offer new approaches and perspectives on the production of this type of object.

Endnotes

(a) The first primer flask is attributed to Islamic Turkey during the Ottoman period ($12^{th}/18^{th}$ century), while the second is attributed to India in the $13^{th}/19^{th}$ century, according to the eBay website. However, neither listing mentions the object's source. Based on their materials and resemblance to other examples, both flasks could be Iranian, particularly likely for the second flask, as a similar flask on the Vikingsword website is attributed to Persian Barud Dan (Primer flask), see [8]. Additionally, some elements of its decoration are quite similar to those of some primer flasks in Gayer-Anderson collection, nos. 1671, 1706, 1289, see [1].

(b) The source of both primer flasks is unknown, but they were attributed to Buchara in the $13^{th}/19^{th}$ century on the website. The bird's interpretation is almost like the bird's head of the previously mentioned example of the Bolk website (fig. 3-b). For the two examples, please review, see [9,10].

(c) Brass alloy or *berenj* in the Persian language was mentioned in many historical books, dictionaries, and some treatises of craftsmen, see [12].

(d) For further details of some Persian examples, see [18]. For some examples of the Seljuq, Safavid, and Qajar examples, see [19].

(e) For some examples of these vessels, check the Catalogue. In B. L. Elényi & I. N. Szántó (eds.) Artisans at the Crossroads, plates C.4.1.4, C.4.1.5, C.4.1.6, C.4.1.7, C.4.1.8., C.4.1.9, C.4.1.10. [20].

(f) For more details, see [2].

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