



## **Artificial Eye in Burnt City and Theoretical Understanding of How Vision Works**

**\*Abdorreza Naser MOGHADASI**

*MS Research Center, Neuroscience institute, Sina Hospital, Tehran University of Medical Science, Tehran, Iran*

**\*Corresponding Author:** Email: abdorrezamoghadasi@gmail.com

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### **Dear Editor-in-Chief**

The archeology team of the Burnt City, supervised by Dr. Seyed Mansour Seyed Sejjadi, made a significant discovery in 2007. In this excavation, they discovered world's oldest artificial eye that belonged to a woman of 28-32 years (1) (Fig. 1-A). The artificial eye, discovered in an ancient grave, was in the left eye socket of the woman. The archeology team estimated the age of the eye between 2900 and 2800 BC. This artificial eye should be considered as the first ocular prosthesis in the medical history. At first, it seems that designing the eye was associated with aesthetic aspects. In other words, it can be considered as an ocular prosthesis for further beautifying the beholder who was probably a rich, high socio-economic class woman. The following reasons confirm the hypothesis. First, the artificial eye was discovered in its supposed place, i.e. the woman's left eye. It can be said that the (artificial) eye was considered as a body organ of the owner, compensating for her deficiency (absence of the left eye). Second, the design of the eye was a copy of the anatomy to keep its natural appearance: 1. Like a natural eye, it has a convex surface and spherical feature (the artificial eye is hemispherical); 2. The eye has a smaller circle in the center that actually is the corneal; 3. There are white spots on the conjunctiva that is likely to be a copy of a natural purely white eye; 4. It was found that there were golden wires inside the eye designed as

fine capillaries which shows the familiarity of the designers with ocular anatomy (Fig. 1-B) (1). However, there are more points about this artificial eye implying that beyond aesthetic aspects, designing the eye indicates the presence of thought on the significance and state of vision. This artificial eye possesses characteristics beyond just an imitation. There are lines on this eye that cannot be seen in a natural eye and the most important ones are eight regular radial lines drawn from the center of the smaller circle (corneal) (Fig. 1-B) (1). What do the regular radii, reminding us of sunrays, indicate? The interpretation of the radii, particularly because they are institutionalized in an artificial eye, is the very similarity with sunrays. It seems that the artificial eye is not complete without the radii and there would not be an eye unless there is light and brightness. We obtain the ability to see when the sun shines. It should be taken into account that for some time there was a belief (Emission theory) stating that seeing is associated with light emanating from the eye to objects (2). The significance of light for seeing was so highlighted that besides keeping the natural form, the designers established this physical concept in the artificial eye, which again is an evidence for their knowledge of ocular anatomy and the issue of vision, especially its physics. We have a strong proof for this claim and that is a small bowl belonging to 5000 years ago found in

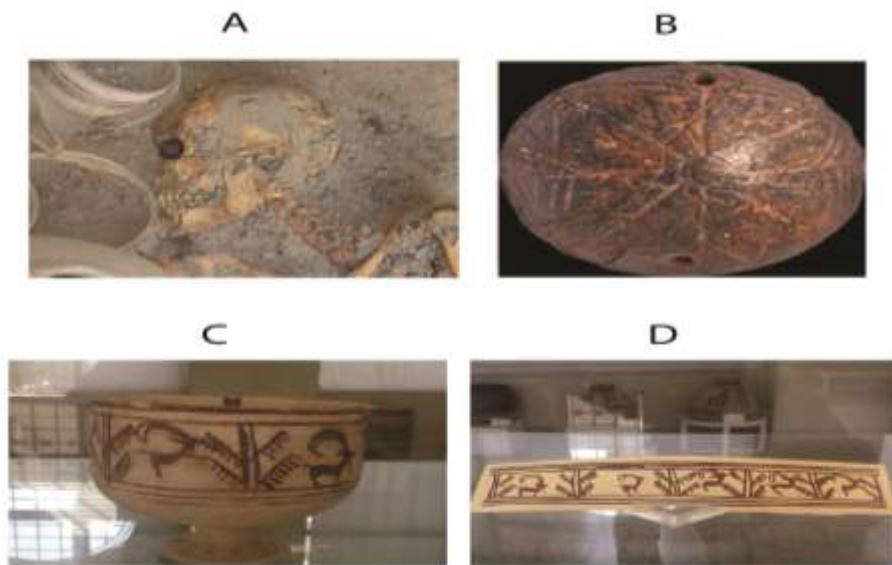
the Burnt City in 2004 and is kept in the Ancient Iran Museum (Fig. 1-C) (3). Picture of a goat is drawn in consecutive episodes through which it moves toward a tree and starts eating the leaves (Fig. 1-D). In a reconstructed model, images form an animation in a quick review. The Burnt City research team supervisor, Dr. Sajjadi, believes that this is the first discovered animation of the world (3, 4).

Considering our perspective, animation is a moving picture and is actually reconstruction and creation of movement. Creating a moving picture includes a few detailed images, the consecutive combination of which provides an animated image; however, this requires a new look to the surrounding world that seemed to be reached by the

Burnt City civilization. When considering the aforementioned bowl and the artificial eye in combination, it can be claimed that a kind of theory was being formed on “vision” in the Burnt City. It was a theory reflected as rays of light in the first artificial eye of the world. The depth of the theory or the point whether the significance and role of brain in sight were also figured out requires further archeological excavations and researches in this region of Iran.

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**Fig. 1:** A: Artificial eye discovered in Burned City. 1-B: Anatomy of artificial eye is demonstrated in detail. The convex form of the eye and the central circle is an imitation of natural eye. Eight regular radial lines added to the anatomy of the eye are drawn from the smaller central circle to the outer part. 1-C: A small bowl bearing world's first animation. 1-D: The animation demonstrates a goat moving toward a tree

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