Journal of Scientific Exploration
Anomalistics and Frontier Science

LETTER TO THE EDITOR

A Persistent Avian Formation on a South-Facing Slope along the Northwest Rim of the Argyre Basin

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https://doi.org/10.31275/20222431

This report updates a paper published in this journal in the Fall of 2011 (Saunders et al., 2011). The original paper analyzed an avian-shaped feature that rests below a network of cellular structures found on a mound within the Argyre Basin of Mars. The paper included analysis of the avian formation by a geologist, Michael A. Dale, and a geoscientist, William Saunders, along with three veterinarians: Amelia Cole, DVM, Joseph Friedlander, DVM, and Susan Orosz, DVM. The area examined is located near 48.0° south and 55.1° and is supported by images from both Mars Global Surveyor and Mars Reconnaissance Orbiter (MRO) spacecrafts. The images reveal defining aspects of this avian feature, including a head, beak, body, eye, legs, foot, toes, wing, and feathers, which have been persistent over a period of more than 20 years. When taken together, these components induce the visual impression of an avian-shaped formation exhibiting a unique set of proportional features that include 23 points of anatomical correctness. A new MRO HiRISE image has been acquired revealing additional features and detail.

UPDATING WITH A NEW IMAGE

The new MRO HiRISE image of the avian formation was acquired in 2021. Independent researcher R. DeRosa filed a targeting request for higher-resolution images of the avian formation at the MRO HiWish site on March 9, 2014 (ID 97522). His request, which was titled "Region within Nereidum Montes," was granted, and the new image was acquired on January 1, 2021. The MRO HiRISE image ESP_020794_1860 (Figure 1) was released on January 14, 2021, and titled "Layered Knobs and Rectilinear Ridges in Nereidum Montes" at the Arizona University site (DeRosa 2014) and titled "Parrotopia" at the HiWish site.

The MRO HiRISE image ESP_020794_1860 (Figure 1) was acquired in winter during the early afternoon with a resolution of 50.4 cm per pixel (ESP_020794_1860 2021). This MRO HiRISE image provides the highest resolution to date and confirms all of the anatomical features observed in the earlier images with exquisite detail.

The avian structure (Figure 2) is composed of eight segments that include an extended right wing (1), beak (2), face (3), neck and crop (4), body (5), lower leg/foot (6), vent and tail feathers (7), and second leg/foot (8). These segments are differentiated by height, color, patterning, contour, and lithology.

ANATOMICAL ANALYSES OF THE AVIAN FORMATION

There are distinct anatomical similarities between the features found on the formation located at Argyre Basin (Figures 1 and 2) and avian species. The analytical drawing in Figure 3 identifies a set of 23 points of confirmation (labeled A–W) that provides evidence that the formation at Argyre Basin not only represents an avian creature, but that its sculptured features appear anatomically correct.

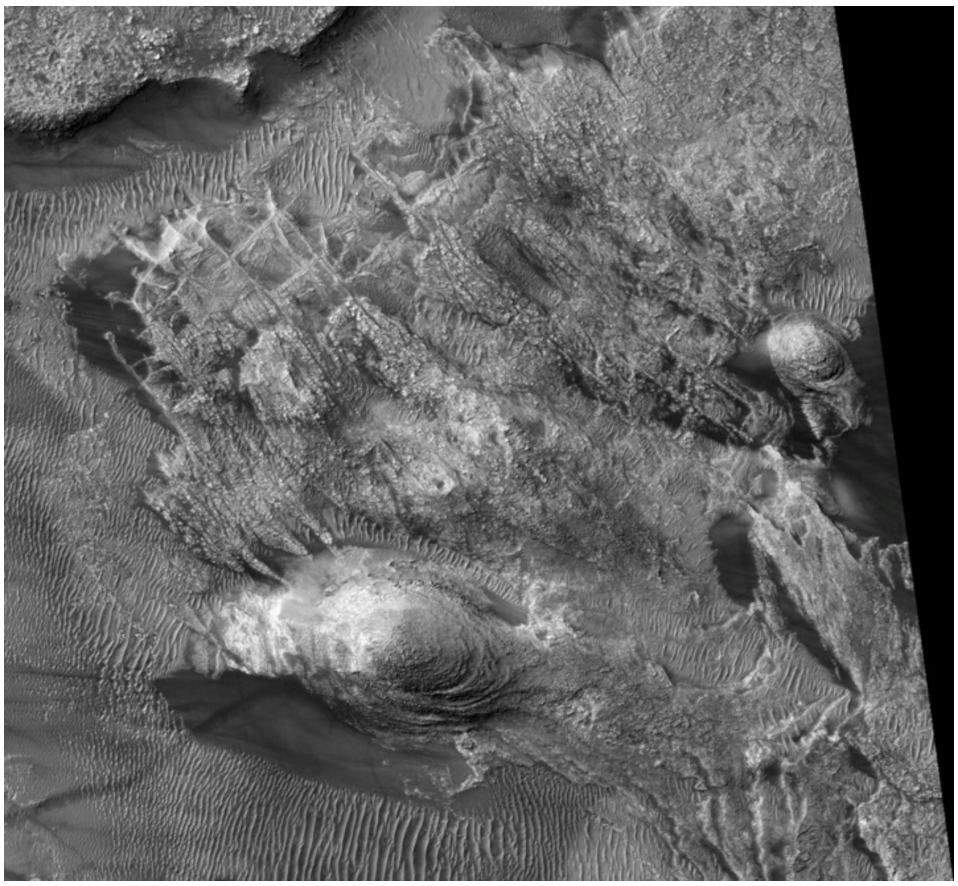

Figure 1. Avian formation. A portion of Mars Reconnaissance Orbiter HiRISE image ESP_020794_1860 (2021). Courtesy NASA/JPL/University of Arizona.

Figure 2. Eight segments of the avian formation. Detailed crop of Mars Reconnaissance Orbiter HiRISE image ESP_020794_1860 (2021). 1) extended right wing, 2) beak, 3) face, 4) neck, 5) body 6) first leg/feet, 7) tail feathers and 8) second leg/feet. Courtesy NASA/JPL/Arizona University. Notation and line annotations by George J. Haas.

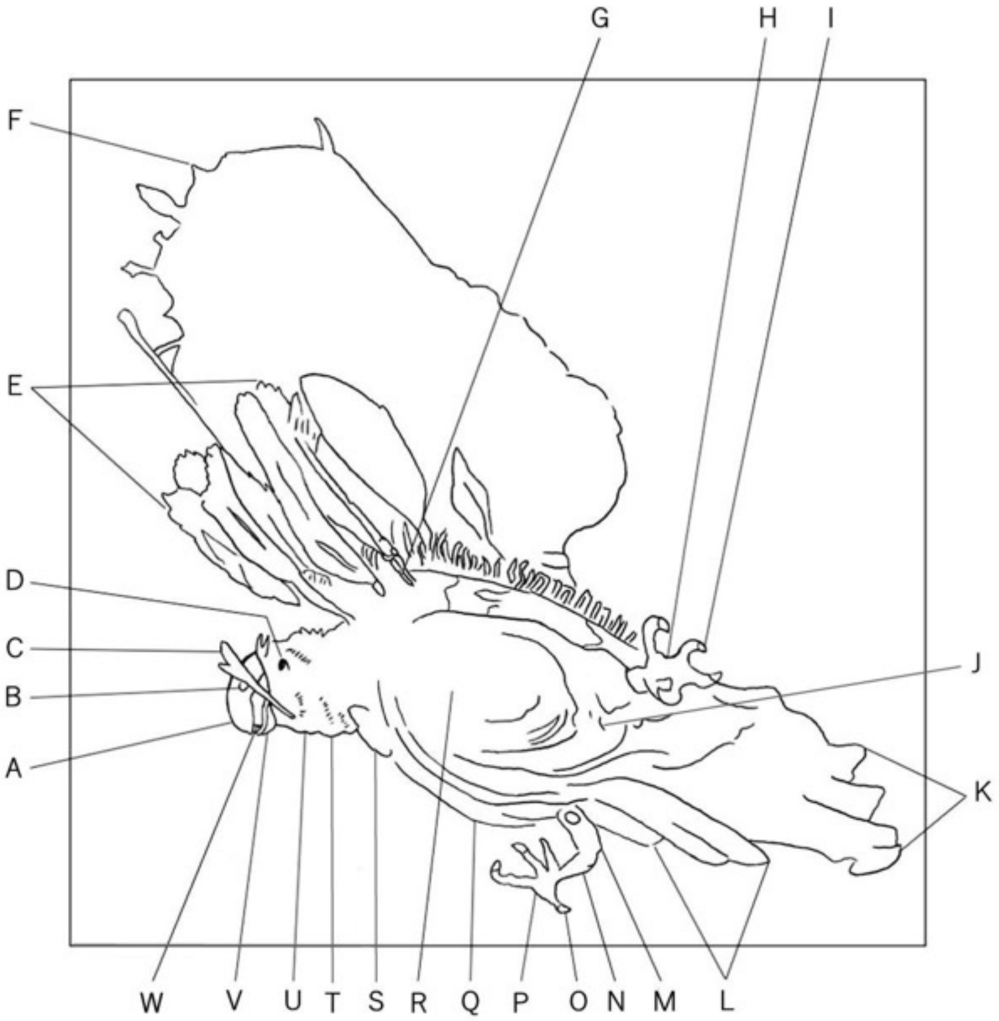

Figure 3. Avian formation. A) Beak. B) Cere. C) Crest. D) Eye. E) Primary flight feathers. F) Expanded wing. G) Feather shaft. H) Right foot and toes. I) Claw. J) Cloaca. K) Tail feathers. L) Upper tail feathers. M) Tibia. N) Tarsus joint. O) Claw. P) Left foot and toes. Q) Folded right wing. R) Abdomen. S) Crop. T) Neck. U) Head. V) Jaw. W) Tongue. Analytical drawing by George J. Haas, with notations by Erica Mollica, DVM. Image source: Mars Reconnaissance Orbiter HiRISE image ESP_020794_1860 (2021).

Examination of the formation at Argyre Basin (Figures 1, 2, and 3) reveals features of the avian species. Rostrally (left), one can see the beak, with its maxilla mandible surrounding the tongue. Features of the head are clearly visible. The cere is noted dorsal to the maxilla. The orbit, papillary margin, and opening of the external ear canal are evident. The head appears smooth and highly reflective. Down feathers are seen in the cervical area. Visible in the thoracic region is the left wing folded in a natural position. Primary feathers cover this region. Ventrally is the pectoral area ending at the point of the keel. Caudally (to the right) is the abdomen and right pelvic limb. Four digits, tarsometatarsus, and tibiotartus are clearly visible. The formation includes the proximal portion of tail feathers that extend from the rump (Saunders et al., 2011). There is also a protruding crop along the neck and evidence of a cloaca at the rear end of the avian formation. Just rostral and dorsal to the tail feathers is a left pelvic limb with four digits.

VETERINARIAN ANALYSES OF THE ANATOMICAL FEATURES OF THE AVIAN FORMATION

The first three veterinarians who contributed to the original paper were provided with copies of the 2021 MRO HiRISE of the Parrot Geoglyph and found all of its previously identified anatomical features to be consistent. They also identified a second foot, located just rostral and dorsal to the tail feathers, which included a left pelvic limb with four digits.[1]

A fourth veterinarian, Erica Mollica, DVM, contributed her analysis of the 2021 MRO HiRISE of the Parrot Geoglyph and found all of its previously identified anatomical features to be consistent, including the second foot. She also identified two additional anatomical features. She identified a cloaca (vent) at the rear end of the avian formation covered by shorter feathers on the lower abdomen, which appears as a slit that allows waste and eggs to pass. The second anatomical feature is the crop, a muscular pouch used as a storage compartment for food on the upper sternum area (thoracic inlet) in the avian formation. It is a dilated part of the esophagus and often protrudes out from the body.[2]

THE GEOLOGICAL CONTEXT FOR THE AVIAN FEATURE

The individual features that produce the avian formation within the Argyre Basin region of Mars are accurately depicted and remain clearly visible in the current MRO HiRISE image (Figure 1). The overall impression of this area of Mars is that regardless of the nature of the varied lithology or the nature of depositional and erosional agents, the avian-shaped formation is indeed exceptional in its physical appearance and anatomical completeness. While there are known geological mechanisms that can create the anatomical accuracies presented in this formation, the natural creation of a formation with 23 points of anatomical correctness seems to go well beyond the probability of chance. An expanded geological analysis of the avian feature can be found in the previous paper published in this journal during the Fall of 2011 (Saunders et al., 2011).

CONCLUSION AND RECOMMENDATIONS

With respect to the modeling of these anatomical features, the visual perception of this avian formation appears to have permanence and is not the result of a transient phenomenon or an illusionary projection. One interpretation is that this formation was originally a natural landform that was modified to illustrate the required features of a recognizable bird. Therefore, we conclude that the surface features that produce the unique avian components of this portrait are real and exhibit a level of consistency that is highly suspected of having artificial origins.

In an effort to expand our dataset, we recommend that NASA send a surface rover to examine the avian formation and utilize its new helicopter drone technology (Greicius, 2021). The drone can acquire close-up aerial views of these surface features from multiple angles and elevations. We also propose the use of the Shallow Subsurface Radar (SHARAD) instrument, which can detect changes in the electrical reflection characteristics of rock, sand, and any water that may be present in the surface and subsurface. High-density rock is highly conductive and provides a strong radar return. The instrument can detect changes in the reflection characteristics of the subsurface, caused by layers deposited by geological processes in the ancient history of Mars (Seu, 2006). If these avian features are found to be consistent, we would encourage the pursuit of a ground survey to determine the origins of this formation. We maintain that this site is a prime candidate for the study of potential archaeological artifacts on the surface of Mars.

ACKNOWLEDGMENTS

We would like to recognize the late Wilmer Faust for bringing this avian feature to our attention in 2002, and Zenith A. Haas for her assistance in completing this paper. Special thanks go out to the four veterinarians: Amelia Cole, DVM, Joseph Friedlander, DVM, Susan Orosz, DVM, and Erica Mollica, DVM for their in-depth analysis of the avian formation. We also acknowledge and thank NASA for the use of the Mars Reconnaissance Orbiter HiRISE image and its image data.

NOTES

[1] A personal communication with Amelia Cole, DVM, Joseph Friedlander, DVM, and Susan Orosz, DVM, April, 2021.

[2] A personal communication with Erica Mollica, DVM, Carroll Gardens Veterinary Group, February 27, 2022.

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