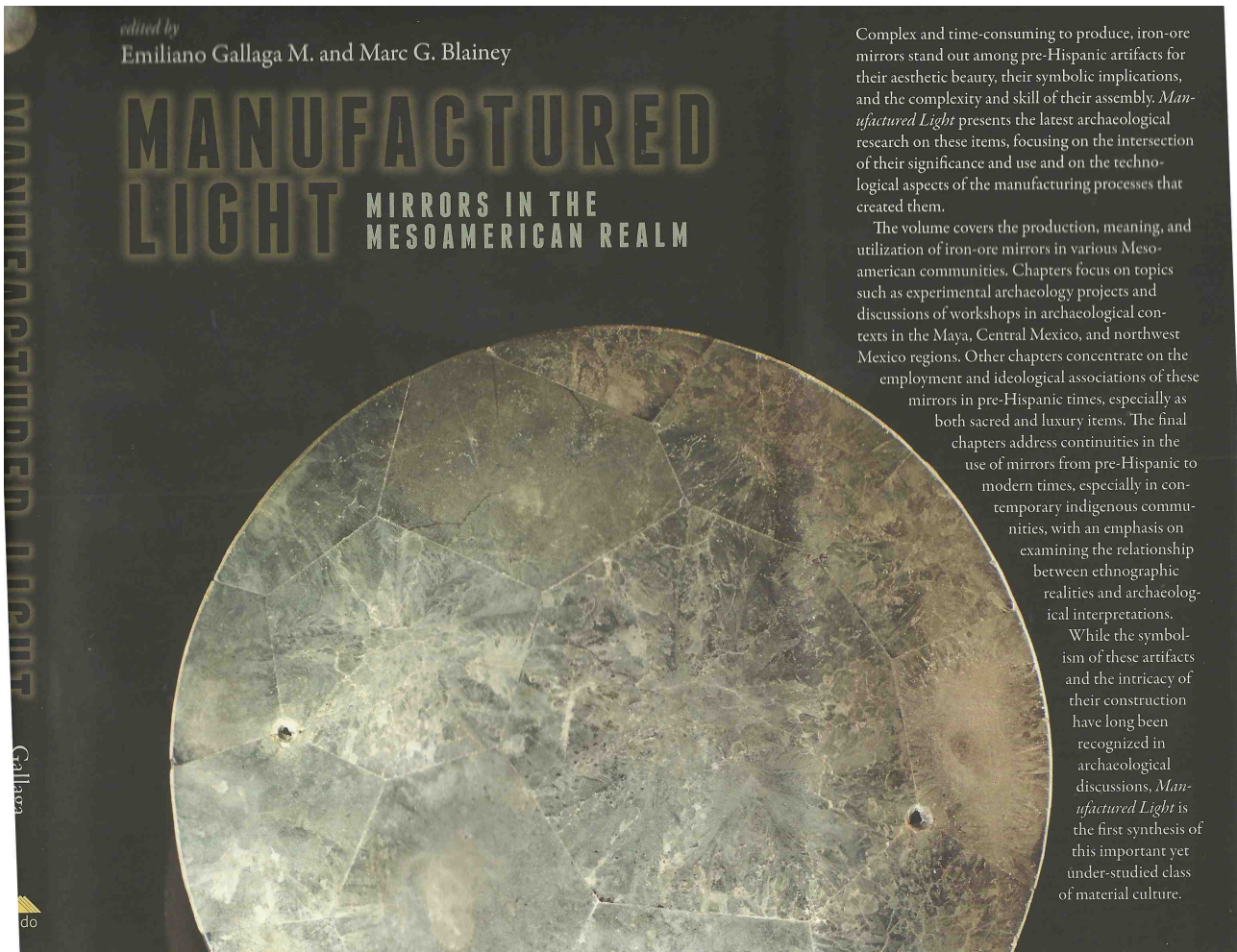


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"This book fills a theoretical and analytical gap in our understanding of Mesoamerican lifeways and world views and is necessary for any Mesoamerican archaeologist who wishes to consider the entirety of the archaeological record."

—ZACHARY HRUBY, NORTHERN KENTUCKY UNIVERSITY

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## 6

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I made efforts to envisage how low-reflectivity (20%) polished-stone artifacts (i.e., “mirrors”) made in Central and South America would have been employed in ancient times, and performed some experiments to prove the suggested possibilities. For example, I describe how it would be possible to make images of objects with an intense light source (mainly by direct sunlight), with the mirror located in its shadow, and how curvature affects the luminous intensity and the capability of making images of large objects. I also consider the possible use of mirrors for communicating at long distances through reflections. Some examples are given to consider the sharpness of the image as of good quality. The mirrors’ ability to concentrate the sun to make fire is also discussed, making some experimental simulations. Some possibilities of mountings to hide the object to give a phantom impression are also considered.

As the chapters in this volume indicate, reflective optical elements are a proof of a sophisticated culture in action. Such objects are mentioned as being employed in several ancient cultures (Andersons 2007; Enoch 2006). The Egyptians used reflective optical elements to illuminate the inside of tombs, or to give the impression of mystery and supernatural power (Enoch 1999). In ancient Greece, Archimedes suggested burning enemy ships by concentrating the reflection of mirrors (Simms 1977). Mirrors are also mentioned as a product of ancient China (Xiu 1996).

*On How Mirrors Would  
Have Been Employed in  
the Ancient Americas*

JOSÉ J. LUNAZZI

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image quality is not a fundamental concern (Taube 2004: 142). Even reflectivity power is not important, because just as sunlight is reflected by the lateral glass of a car's window (what corresponds to less than 5% reflectivity), light was also noticed at our observation base at 1.2 km distance from the car. It is clear that the communication distance can be further increased if we consider pyrite mirrors like the archaeological examples reported as belonging to the ancient Maya, because they have 60% reflectivity. Future experiments can shed light on the capacities of ancient Maya mirror specimens.

### CONCLUSIONS

To situate the importance of the analysis for an archaeological audience, this chapter could work as a sort of exploratory or experimental think-piece. Experiments were made and necessary parameters analyzed to help in evaluating six possibilities for the ancient use of low-reflectivity stone mirrors already considered previously. Self-observation of one's face was reported, suggesting the need of sunlight. Observation of symmetrical images, although natural for plane mirrors, was applied to situations where the sky and its elements are important, and symmetry of the image was considered not only as a transversal property but longitudinal too, because depth is a very important element always present for the recognition of images (the reason for our binocular vision). Floating images, although evident when holding a concave mirror, were not specifically mentioned by other authors and are now proposed as a subject for future consideration. A physical explanation was given for why some mirrors were made with two curvatures. A possible way of making fire by using a mirror to manipulate sunlight was also detailed. And finally, a possibility of optical communication, not previously known to the author, was tested and analyzed. It is my hope that this work may help archaeologists in their evaluation of the fascinating civilizations of the ancient Americas, pre-Columbian cultures about which much remains to be revealed.

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