Beautiful Light: Optics and its Importance in Art and Astronomy

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Churches, Pinhole Cameras and Perspective: How Renaissance Optics Transformed Our World

This class will take a look at the 'discovery' of perspective during the renaissance. Using Italian churches as our classroom, we will examine the use of churches as giant camera obscuras for the study of astronomy (used in computing the exact date of Easter among other things), as well as examples of pinholes used to make normal and anamorphic frescoes on the interior walls of many religious buildings. We will also put these discoveries to use ourselves, creating pinhole cameras to make our own photographs and building grids, a camera obscura and other rennaisance optical devices to learn to draw with perspectival accuracy. This course also raises many interesting issues relating to the attitude of the church towards science through history. In fact, the church "gave more financial and social support to the study of astronomy for over six centuries (culminating in) the Enlightenment... than any other institutions, " according to Dr. John Heilbron, author of a 1999 book on the subject of 16th-18th centruy solar observatories found in European Cathedrals.

Either Rome or Florence would be an excellent site for this class. In Rome, Santa Maria Degli Angeli, San Ignazio, the Torre dei Venti (Tower of the Winds) in the Vatican as well as the Piazza of St. Peter's itself have crude solar observatories and calendar devices. The Cavalieri di Malta (Knights of Malta) building has a still functioning fixed eyepoint keyhole in its gate for viewing the Dome of St. Peter's at the end of a pathway created by a formal row of cedar trees. Many Churches in Rome feature architecture and paintings that used perspective for convincing visual accuracy as well as outrageous illusions like Borromini's Colonnade in the Palazzo Spada or Maignan's fantastic anamorphic painting of St. Francis in the monastery of Trinita dei Monti.

Florence features many renaissance landmarks created with the aid of perspectival vision. From Brunelleschi's creation of a small apertured perspective device (the first camera?) in 1420 came many great works of art and the road to photography, film and video cameras whose images saturate our world today. Alberti painted images in small boxes to be looked at through a tiny hole. Pinholes in churches used for telling time and predicting the calendar for many years into the future include the Duomo, Florence's great cathedral and Santa Maria Novella as well as churches in nearby towns including Siena, San Gimignano and Bologna. This area also features many great works of art created with ocular devices including Massacio's Trinity in Santa Maria Novella and Ghiberti's doors of the Cathedral Baptistry in Florence. Donatello's Feast of Herod from the baptismal font in the church of San Giovanni in Siena is also a great example of this, and there are many more nearby.

This area is perfect for the kind of hands on class that I like to teach. The class will include historical information, first hand viewing of works of art, and give the students a chance to create their own art inspired by these brilliant two and three dimensional works. Having spent my junior year abroad in Rome (11 months) and travelling through much of Tuscany, I am very familiar with these churches and cities as well as the difficulties involved with travel, schedules and using churches as history classrooms. My Italian is very rusty, but would quickly rebound to passable pretty quickly, as it has in past trips.

The use of pinhole cameras does not require a full scale darkroom, and most of these devices can be made using simple tools, rudimentary materials and found objects. Several refernce books would be used including "The Hole Thing: a Manual of Pinhole Photography" by Jim Shull; "The Sun in the Church: Cathedrals As Solar Observatories" by John L. Heilbron; "Optics, Painting and Photography" by M. H. Pirenne; "Pinhole Photography: Rediscovering a Historic Technique" by Eric Renner and David Hockney's recent book on Camera Obscuras and Paintings. My five years of teaching photography including many pinhole photography workshops, as well as my years of experience with drawing and painting make me well qualified to teach this class.

Brian Moss