Science in culture

Shaping up at Olympia

Geometry lies at the heart of sculptures from the Temple of Zeus.

Stefano Grillo

The Temple of Zeus at Olympia was erected in around 450 BC, just a few paces from the stadium that was home to the original Olympic Games. The temple's eastern pediment was adorned with sculptures that tell of one of the main events of the competition: the chariot race.

According to legend, Oenomaus, king of Olympia, was told by an oracle that he would perish at the hands of whoever married his daughter, Hippodameia. So he decided to challenge each of her numerous suitors to a chariot race: only if they won could they marry his daughter. This was a shrewd plan, because his horses were a gift from the gods and hence were invincible. But Pelops, one of the suitors, was even shrewder: he bribed the king's charioteer, Myrtilos, to replace the screws holding the wheels with ones made of wax. During the race, the wax melted and the king was defeated and killed. Pelops then married Hippodameia, thus fulfilling the oracle's prediction. The region where Olympia is located (the Peloponnese) was named after him.

The pediment (shown at the top) is now preserved in the Archaeological Museum at Olympia, which re-opened in spring after renovation. The pediment's simple, sober composition shows the characters before the race. Zeus, appropriately placed at the centre, separates the self-assured Oenomaus and his wife on the right from the bold Pelops and his future wife Hippodameia, whose rigid pose is brought to life by the angle of her head. Nobody knows how the race will turn out except for an old seer — in whom the dignity and venerability of old age are magnificently rendered — sitting behind the horses on the right.

A sense of balance: Piero della Francesca used symmetry in the *Madonna del Parto*, in an echo of Greek sculptures from the Temple of Zeus (top).

These remarkable sculptures were created at a momentous time in the history of art: the early Classical period. The cultural achievements of this age have been eloquently termed "the Greek miracle". The stones seem to have a calm, serene life such that, far from being paler copies of reality, they communicate to us a heightened, fuller sense of it. The majestic, frozen poses of the figures — who, apart from the seer, betray no emotion — are reminiscent of works by the Renaissance painter and mathematician Piero della Francesca. In both artistic styles, geometry plays an important role.

The geometry of the pediment's composition is apparent both in its overall symmetry and in the details. The gradual rotation of the heads of the

four horses at regularly increased angles, more clearly visible in those on the right than in their damaged mirror image on the left, serves to enhance the sense of order, simplicity and enigmatic stillness of the scene. This rotation is balanced by the kneeling poses of the two figures in front of the horses, placed in mirror symmetry; their legs are raised at angles that would have pleasingly echoed the lines of the top of the pediment. There is another figure in a similar pose on the left. A young man sitting at the far right (not shown) — one of the best sculptures in the group — is a variation on this theme, with his position turned by 90 degrees towards the observer.

Piero used similar geometric operations in his compositions. The positions of his characters are often obtained by translations and rotations at different angles of the same human figure — and the figures in turn are generated from geometrical bodies. As for mirror images, on one occasion Piero used both sides of the same preparatory drawing to draw the contours of two symmetrically placed angels.

Of course, geometry by itself does not make good art — but it can powerfully enhance a work's meaning if it springs from the same source as the work. In Piero's world, geometry expressed the divine order of God's creations. In the Olympia pediment, geometry contributes to the harmony and serenity of the composition. These are the harmony and serenity of the Greek Classical world; they have inspired many subsequent artists but have never been equalled.

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