Another (and armless) army

Paul G. Bahn

ANOTHER terracotta army has been discovered in Shaanxi Province, China, in the same region as the famous one found in 1974. The new army, now described by W. Zhaojin and M. Hong (*Archéologia* 265, 4–5; 1991), is much smaller in stature, but looks to be far larger in numbers.

The discovery 17 years ago, by a farmer digging a well, of the life-size terracotta army of China's first emperor Qin Shihuangdi led eventually to this "eighth wonder of the world" becoming an attraction for tourists, who come in droves to see the 7,000 clay warriors still standing in their vault, now protected beneath an enormous hangar. Such has been the popularity of this archaeological marvel that plans were made to build a new airport, which will require a new 19-km motorway to link it with the city of Xian.

It was in the course of constructing the motorway in March last year that the new find was made. Four necropolises of the Han (206 BC–AD 220) and Tang (AD 618–907) dynasties had already been encountered in the vicinity. Tests were made in a wheatfield located 300 m south of the tomb of the wife of the emperor Liu Qi, who was known during his reign as Jing and who lived from 188 to 144 BC; he and his wife were buried at Yangling, 22 km northwest of Xian.

At a depth of 6.5 m, a small orange potsherd was found, which was soon identified as the shoulder of a statue. The whole field was then prospected, and the Archaeological Institute of Shaanxi Province sent in a team of specialists in the study of Han tombs, led by Wang Xueli, chief excavator of the famous terracotta army.

The new site proved to cover 96,000 m², the size of twelve soccer pitches. It contains an army of terracotta figures, associated with the two tombs, and housed in 24 vaults about 20 m apart and in 14 rows aligned north–south. The vaults are 4–10 m wide, and 25–291 m in length. They are therefore smaller than the Qin dynasty pits, but they cover an area about five times as large. Their different sizes may correspond to those of the army units they contain (one contains mostly cavalry, another may be the headquarters).

All the human statues are of naked men, with no arms; they are about 50 cm high. The whole body is painted an orange–red colour, with hair, eyebrows, beard and eyes coloured black. Their clothes, assumed to have been of linen or silk, have disintegrated. There are different theories about the arms. Some researchers believe they may have been held on with rods of precious metal, which were subsequently stolen. Others think it likely that they had movable wooden arms, which have disintegrated like the clothing.

The figures have graceful forms and delicately sculptured faces. Each one is different from his fellows in age and in facial express-

ion, which ranges from severe to smiling. In their remarkable realism they resemble the life-size figures which are about a century

swords, chisels and agricultural tools, carts, jewellery and coins — all of them, like the men and horses, one third life-size.

More than 300 statues have been uncovered so far, but it is certain that thousands remain buried; estimates of the total vary from 10,000 to a million, and excavation will continue for two to three years. Meanwhile,

IMAGE
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REASONS

Minute men of China's new model army (picture courtesy *Archéologia*).

older. But it is the differences that are the most striking: not only are the Qin figures life-size, but their arms and their uniforms form an integral part of the statues. Also, the Qin figures are hollow, whereas the new discoveries are solid.

The new army is accompanied by weapons of copper and iron, arrowheads, spears,

the motorway project goes ahead, though now a bridge, 320 m long, will be constructed over the site, and an underground museum is being planned to enable the inevitable tourists to see the new army. □

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REPRODUCTIVE BIOLOGY

Do sperm find eggs attractive?

John Aitken

STUDIES described by D. Ralt and colleagues in *Proceedings of the National Academy of Sciences*¹ suggest that the conventional wisdom about how male and female gametes make contact in the reproductive system of the human female is wrong. The authors provide evidence for the existence of a chemotactic factor that attracts spermatozoa to the egg, thereby opening up an entirely new perspective in reproductive biology.

In the past, the best evidence for sperm chemotaxis has come from invertebrate species, such as sea urchins, that engage in external fertilization. These species shed their gametes into the ocean, necessitating the evolution of intricate species-specific mechanisms to ensure that the spermatozoa not only find eggs, but eggs from the right species. By contrast, spermatozoa in species exhibiting internal fertilization, in which the sperm are released into the confines of the female reproductive tract, were thought to

find their quarry by behaving like Scottish salmon heading up-river towards their spawning grounds.

This analogy was based on the fact that the only form of orientation recognized in human spermatozoa was rheotaxis, in which the male gametes swim against the current in a moving body of medium. Because the flow of fluid in the female reproductive tract is outward, the spermatozoa inevitably move upstream, in the direction of the ampullary region of the fallopian tubes, where fertilization occurs. Initial contact between the male and female gametes was thought to be the consequence of a chance collision, followed by a highly specific, cell-recognition event that resulted in the tight adhesion of the spermatozoa to an acellular membrane surrounding the egg, known as the zona pellucida.

Ralt and colleagues now propose that the fluid that bathes the oocyte during its dif-