**Missiles Through the Ages**

By JOHN A. MENAUGH

Once upon a time—no one knows how many thousands of years ago—a hairy creature, half man, half ape, died in his calloused hands a knuckle, or a flint of stone, or possibly even a fragment of jagged ice, and buried it with intent to hell. Old records may have traced the skull of another ape man or may have lashed heraldically the ribs of a woolly mammoth. Most likely, however, and for an obvious reason, it missed its mark entirely.

It was the world's first projectile propelled by man. It was the world's first projectile hurled by the beastlike cave man.

Early warriors not only employed the spear or javelin as a weapon of hand-to-hand fighting, but also used the bow, which could be made effectively for considerable distance.

The bow was invented in prehistoric times, flint arrowheads being found in association with the remains of Neanderthal man. The bow was used by the ancient Egyptians around 4000 B.C., the Chinese around 3000 B.C., and by the Chinese around 2000 B.C. It was the bow that enabled theophants to slay tr-e beasts of field and forest and to conquer his human foe, and also enabled him to project a missil hurled by the beastlike cave man.

Nature of Missiles Changed

The introduction of gunpowder into the business of war in the fourteenth century initiated a revolution in the science of arms. It made possible the development of firearms as distinct from manmade arrows or spears. It was in the fourteenth century that the ‘sword’ of battle of that period was no longer the sword of hand-to-hand fighting, but the sword of the longbow, which could be made effectively for considerable distance.

### Maximum Ranges of World War Artillery

<table>
<thead>
<tr>
<th>Artillery Type</th>
<th>Maximum Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>U.S. 3-inch gun</td>
<td>4000 yards</td>
</tr>
<tr>
<td>German 10.5 cm howitzer</td>
<td>7000 yards</td>
</tr>
<tr>
<td>British 15 cm howitzer</td>
<td>5000 yards</td>
</tr>
</tbody>
</table>

### Nature of Missiles Changed by Gunpowder

Early war engines included the catapult, employing twisted fiber or hair for propelling power. The ballista, a large catapult, and the onager, a machine employing the principle of the springboard for projecting missiles, were developed in the period of the Hellenistic era. During all of those centuries man was devising new ways and means of casting missils in order to be able to record his achievements in history. During all of those centuries man was devising new ways and means of casting missils in order to be able to record his achievements in history.

### Examples of early war engines

- **Crossbow**: A small catapult had a maximum range of 200 yards. It was used in the fourteenth century and was the ancestor of the modern firearm.
- **Bombard**: A heavy war engine of long range, capable of throwing large stones. It was used in the fourteenth century and was the ancestor of the modern cannon.

### Modern Missiles

- **Ballistics**: Missiles are propelled by a variety of means, including gas, liquid, and solid propellants.
- **Guidance Systems**: Modern missiles are equipped with guidance systems that allow them to be directed to their targets with high accuracy.

### Historical Examples

- **Greek Catapults**: Used in the first century B.C. to project huge stones as missiles.
- **Muskets**: Used in the 17th century to shoot muskets at long distances.
- **Cannon**: Used in the 17th century to shoot cannonballs at long distances.

### Modern Missiles

- **Missile Types**: Include air-to-air missiles, air-to-ground missiles, ground-to-air missiles, and ground-to-ground missiles.
- **Guidance Systems**: Use radar, infrared, and other sensors to guide the missile to its target.

### Future Missiles

- **Quantum Missiles**: Experimental missiles that use quantum computing to target and destroy targets.
- **Neural Missiles**: Missiles that use artificial intelligence to adapt and change their flight paths in response to changing conditions.

### Missiles Through the Ages

- **Early Missiles**: Used in the prehistoric era, such as the bow and arrow.
- **Medieval Missiles**: Used in the Middle Ages, such as the crossbow and the cannon.
- **Modern Missiles**: Used in the modern era, such as the guided missile and the cruise missile.

### Conclusion

Missiles have evolved from simple weapons to highly sophisticated systems that can strike targets thousands of miles away. The science of missiles is a complex and dynamic field that continues to evolve with new technologies and discoveries.