

# Muslim Rocket Technology

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**Release Date:** **July 2002**  
**Publication ID:** **4036**

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## MUSLIM ROCKET-TECHNOLOGY

In the 13th century a Syrian scholar, Hassan Al-Rammah wrote a remarkable book on military technology, which became very famous in the west. The first documented rocket is included in the book, a model of which is exhibited at the National Air and Space Museum in Washington D.C. The author visited Washington in September 2000 where he obtained more information not only on the rocket but also on its fuel. Later, he acquired an edited copy of the book from the editor Ahmad Al-Hassan. This report depends on references [1-6].

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### Gunpowder

The Chinese knew gunpowder in 11th century but did not know the right proportions to get explosions and did not achieve the necessary purification of potassium nitrate. The first Chinese book, which details the explosive proportions, was in 1412 by Huo Lung Ching<sup>1</sup>.

Al-Rammah's book is the first to explain the purification procedure for potassium nitrate and described many recipes for making gunpowder with the correct proportions to achieve explosion. This is necessary for the development of canons. Partington<sup>3</sup> says "the collection of recipes was probably taken from various sources at different times in the author's family and handed down. Such recipes are described as tested." Al-Razi, Al-Hamdany and an Arabic-Syriaque manuscript of the 10th century describe potassium nitrate. Ibn Al-Bitar describes it in 1240. The Arabic-Syriaque manuscript of the 10th century gives some recipes of gunpowder. It is assumed that these were added in the 13th century.

The Latin book "Liber Ignium" of Marcus Graecus is originally Arabic (translated in Spain) gives many recipes for making gunpowder the last four of which may have been added to the book in 1280 or 1300.<sup>6</sup> "Did Roger Bacon derive his famous cryptic gunpowder formula in his Epistola of ca.1260 from the crusader Peter of Maricourt, some other traveller or from a wide range of reading from Arabic and alchemical books". The references <sup>1</sup>, <sup>3</sup> and <sup>5</sup> doubt the correctness and the effectiveness of the recipe of Bacon.

The German scientist Albert Magnus obtained his information from "Liber Ignium" originally an Arabic book translated in Spain.

Evidence of the use of gunpowder during the crusades in Fustat, Egypt in 1168 was found in the form of traces of potassium nitrate. Such traces were also found in 1218 during the siege of Dumyat and in the battle of Al-Mansoura in 1249<sup>1</sup>.

Winter<sup>6</sup> mentions "the Chinese may have discovered saltpeter (i.e. gunpowder) or else that discovery may have been transmitted to them by the Muslims whom they had plenty of opportunities of meeting either at home or abroad. Sarton is referring to Arab-Muslim traders to China, as well as Arab inhabitants in China. As early as 880 an estimated 120,000 Muslims, Jews and Persians lived in Canton alone."

## Canons and Rockets

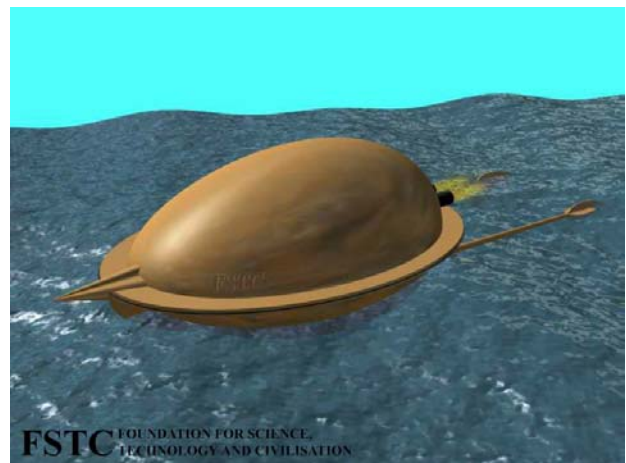
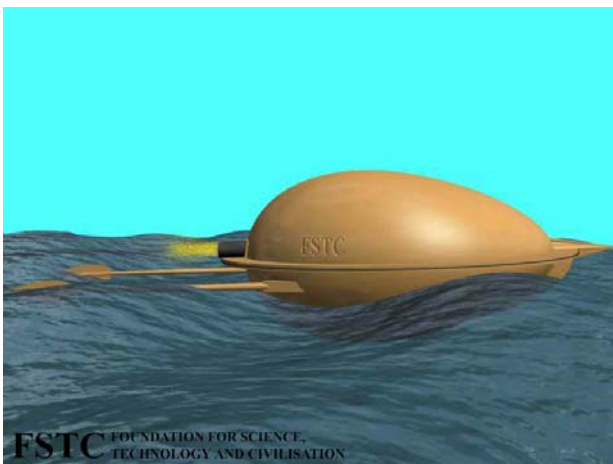
There are four Arabic Manuscripts (Almakhzoun-manuscripts) one in St Petersburg, two in Paris and one in Istanbul)in 1320 describing the first portable canon with suitable gunpowder. This description is principally the same as for modern guns. Such canons were used in the famous battle of Ain-Galout against the Mongols(1260)<sup>1</sup>.

The Mamlouks developed the canons further during the 14<sup>th</sup> century.

In Spain, the Arabs used canons defending Seville (1248), in Granada 1319, in (Baza or Albacete) 1324, in Huescar and Martos 1325,in Alicante 1331 and in Algeziras 1342-1344. Partington<sup>3</sup> says "the history of artillery in Spain is related to that of the Arabs".

Partington<sup>3</sup> mentions "Arabic accounts suggest that the Arabs introduced firearms into Spain, from where they passed to Italy, going from there to France, and finally Germany".

Also reported by Partington<sup>3</sup> "Hassan Al-Rammah describes various kinds of incendiary arrows and lances and describes and illustrates what has been supposed to be a torpedo. This is called 'the egg, which moves itself and burns' and the illustration and text suggest at least that it was intended to move on the surface of water. Two sheet iron pans were fastened together and made tight by felt; the flattened pear-shaped vessel was filled with "naphtha, metal filings, and good mixtures (probably containing saltpetre), and the apparatus was provided with two rods (as a rudder?) and propelled by a large rocket".



**A conceptual model of the floating rocket described by Hassan Al-Rammah<sup>3</sup>, created by FSTC Ltd.**

Ley<sup>4</sup> "But Hassan Al-Rammah adds one unsuspected novelty: a rocket-propelled torpedo consisting of two flat pans, fastened together and filled with powder or an incendiary mixture, equipped with a kind of tail to insure movement in a straight line, and propelled by two large rockets. The whole was called the 'self-moving and combusting egg' but no instances of its use are related"

Winter<sup>6</sup> "The Arabs, in any event, appear to have been the first to inherit (and possibly originate) the secret of the rocket and it was through Arabic writings - rather than the Mongols--that Europe came to know the rocket. Two notable examples of Arabic knowledge of the rocket are the so-called "self-moving and combusting egg" of the Syrian Al-Hassan Al-Rammah (d.1294-1295), details of which may be found in Ley's popular "Rockets, Missiles and Space Travel" and physician Yusuf ibn Ismail Al-Kutub's description (1311) of saltpeter ("they use it to make a fire which rises and moves, thus increasing it in lightness and inflammability").

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## References

1-"Kitab Al-Furusiyya wa Al-Manasib Al-Harbiyya" (Book of Military Horsemanship and Ingenious War Devices) by Najm Al-Din Hassan Al-Rammah(1280), edited by Ahmad Yusuf Al-Hassan, University of Aleppo publications,1998.

2-Ahmad Y. Al-Hassan and Donald R.Hill, Islamic Technology, Cambridge University Press and Unesco,1986

3-J.R.Partington, A history of Greek Fire and Gunpowder, The John Hopkins University Press, 1999

4-Willey Ley, Rockets, Missiles, and Space Travel The Viking Press, 1958

5-Joseph Needham, Science and Civilization in China Cambridge University Press, 1960

6-Frank H.Winter "The Genesis of the Rocket in China and its spread to the East and West", Proceedings of the 13th History Symposium of the American Academy of Astronautics, Munich, September 1979,published by the American Astronautical Society, 1990