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and Manufacturing Engineering



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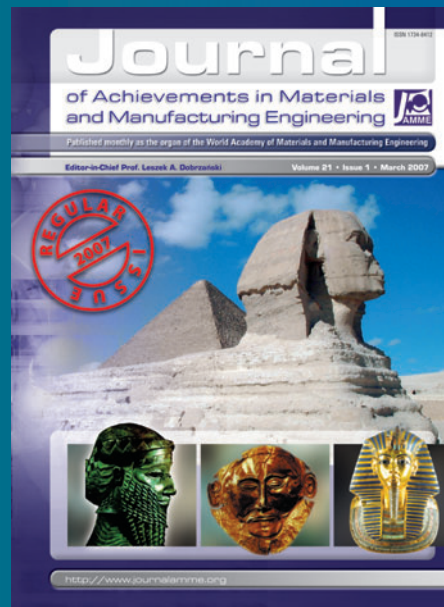
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Cover story

At the beginning of the 18th century one of travelers noticed that "It is too big a bite that time could swallow it". He thought then about Pyramids in Giza near Cairo in Egypt, the oldest of seven miracles of the Ancient World which survived to our times. It is not difficult to count that a sweltering African sun has already risen over it ca. 1 650 000 times. The oldest and the biggest of three main pyramids is the one of the second king of the Fourth Dynasty of Khufu (2589-2566 B.C.) known as Great Pyramid of Khufu of the original height of 146.6 metres (today is lower for ca. 10 metres because there is no surface layer on it). It was built out of 2.3 million of stone blocks transferred



from Aswan having average mass equaled 2.5 tones and reaching even 15 tones. It occupies over 5 hectare of surface. Two smallest ones belong to: 136.4-metre-high one to the son of Khufu – the forth king of the Fourth Dynasty named Khafra (2558-2532 B.C.) and a 70-metre-high one to his grandson Menkaure (2532-2504 B.C.). Three Great Pyramids are surrendered by smallest ones which were intended to be for others members of the royal family. East from the Khafra's Pyramid there are fragments of his funeral temple and platform coming from the lowest temple which is protected by "royal guard" – Sphinx sculpted in the rock over 45 centuries ago and called by Arabs "the one who arouses horror" (Abu-al-Hol). The mighty giant is a mystery till today. In fact it is endowed by Khafra's face with a nose destroyed by Mameluck's and Napoleon's artillerists and a beard moved to the British Museum in London, United Kingdom but it received its lion's body probably yet over 25 centuries before the birth of that pharaoh. As time flew soft limestone underwent partial erosion that is why in last decades two lion's paws of Sphinx were renovated by adding very numerous hand-ground stone blocks. Sphinx and great pyramids in the background presented in the cover photo, named once "eternity from Giza" being silent witnesses of 45 centuries of history and today can be surely treated as undeniable and universal symbol of durability. Durability and reliability are engineering measures of quality of all products. There is nothing strange that those impressive monuments of ancient history make engineers think of engineering design and manufacturing. The creation of structure of engineering materials by the methods of heat-thermal, thermo-chemical and thermo-mechanical treatment and also deposition of coatings and other layers e.g. by welding methods decide about such creation of materials engineering properties that products created from them can have even many times increased exploitation durability than materials do not put into such technological operations. Some papers published in the given Regular Issue including those submitted earlier to the 12th International Scientific Conference CAM'S 2006 are sacrificed to chosen issues from all those ones. The next cover photos are proves of outstanding mastering of ability of metal processing by various technologies by ancient masters which forced to the reflection over technological progress and complex ways of learning the truth because that what was technologically mastered even 40 and something (centuries?) ages ago was managed to be theoretically explained only a few dozen years ago at most. The cast of a bronze head of Sargon of Akkad or his grandson Naramsin – Akkad rulers of the empire founded on the ruins of Sumer dated 23rd century B.C. was found in the rubbish dump in Nineveh (at present in the suburbs of Mosul in Iraq). The golden posthumous mask dated ca. 1570 B.C. known conventionally as a Mask of Agamemnon (who in fact lived in other times) was made by extrusion by a very tiny tool on wooden block and found in 1874 in the royal tombs in Mycenae in Greece by a German archeologist - amateur Heinrich Schliemann who on the basis of Homer's lecture discovered first proves of the ancient Mycenae-Crete culture. The golden mask of Pharaoh Tutankhamun inlaid with precious stones including lapis lazuli, quartz, onyx, garnet, and also feldspar was found in 1922 by Howard Carter in the tomb in West Thebes in the Valley of Kings (Wadi al-Muluk) at west bank of the river Nile in Egypt near Luxor. The respect and humility for broad knowledge and abilities of former producers allow also to have respect to today's advanced technologies and engineering materials with hope that among others papers published in the given Issue of Journal AMME can at least partially contribute to the development of knowledge in the field of materials engineering and manufacturing and technological progress.