

14th HUMAN EXPLORATION OF THE MOON AND MARS SYMPOSIUM (A5)
Long Term Scenarios for Human Moon/Mars Presence (2)

Author: Prof. Jean-Marc Salotti
Laboratoire de l'Intégration du Matériau au Système, France, jean-marc.salotti@ensc.fr

Mr. Thomas Da Fonseca
France, thomas.dafonseca@ensc.fr

Mr. Adrien Lainé
France, adrien.laine@ensc.fr

Mr. Cédric Moisset
France, cedric.moisset@ensc.fr

IMPACT OF HUMAN FACTORS ON THE GROWING RATE OF A MARTIAN POPULATION

Abstract

Objectives In a few decades, the problem of the permanent presence of humans on Mars will be addressed. With current space technology, it is not thinkable to send tons of resources every year from Earth to maintain the quality of life of the population during a long period of time. A sustainable development of the colony will therefore be possible only if the population grows and rapidly achieve a minimum number of persons in order to be able to develop and maintain industrial activities that will allow self sufficiency relatively to the Earth. The goal of our study is to examine possible impacts of human factors on the demographical evolution of the population during that development.

Methodology It is assumed in this study that the settlement is technologically feasible and that the threshold for the minimum number of persons will be achieved thanks to demographical growing with a relatively small number of immigrants per year. First of all, demographical data from several countries have been examined and the impact of human factors has been analysed. From these observations, we came to different options for a scenario of the Martian settlement and a simulator has been developed.

Results The main conclusion of the proposed demographical analysis is that social factors such as religion, culture or public policy have a great impact on the growing rate. Simulations on the computer show that if appropriate options are chosen the population of the colony can easily reach 1 million persons in less than a thousand years. However, if the growing rate is too high, the development might not be sustainable any more. For instance, if the number of children is very high, their education would require the mobilization of too many human resources. A trade-off has therefore to be found.