



Editorial on Inter-Planetary Rock Mechanics

The most incomprehensible fact about nature is that it is comprehensible.

- *Albert Einstein*

Isolation is not possible at anytime and anywhere in the universe; as single big bang is the source of creation of the entire universe, stars and all the planets. As such the engineering properties of soil and rock masses are likely to be nearly of the same order on the moon and the mars and other planets as on the earth. The rock mass classification on the planet earth are likely to be applicable approximately to other planets and their moons with minor changes. The rock masses are likely to be least weathered perhaps on the moon and the mars because of absence of flowing water at present. The dust on the moon is found to be very loose. Its bearing pressure is likely to be very low. The principle of uncertainty is the cause of heterogeneity in the nature. The soil on the moon is likely to be layered as on the planet earth. The seismic refraction survey should be done to understand what is underground? Our software for soil and rock mechanics may be used on the planets with actual 'g-values', seismicity, soil and rock mass parameters etc. The laws of rock mechanics and soil mechanics would be exactly applicable to all the planets with actual parameters. Further research should be done on the inter-planetary rock mechanics and soil mechanics. Research culture is bound to come back to India. The science is beyond anger and passions. The scientists are inspiring by actions. The both luck and talents are important in one's career. Lazy nations have no future obviously. Genetic engineering will create a new genetically educated and capable human race in the future, besides genetically edited animals, fruits and vegetables. Please try to become a strong person, choice is yours how you become a strong person.

The natural caves in rock masses in the moon are very likely to be very wide for the same rock mass quality as on the earth, because of very low value of 'g'. All craters on the moon have humps upwards due to reflection of the shock waves which are caused by the impact of meteorites. Similarly the natural caves in the mars are supposed to be wide due to low g-value. Hence colonies may be established within wide natural caves both inside moon and the mars safely. Moonquakes as recorded are also less than M5 on Richter's scale. So there should be no problem there. The underground colonies inside mars will also be safe from natural disasters like seismicity and very strong dust storms etc. Moon will be used to send rockets safely at low cost to the mars and other planets, due to very low g-value. We are indeed cosmic citizens. Rocks can be used to generate oxygen for astronauts on all rocky planets and moons. The nature is a nano-manager. There is a leader of all the herds of all the species. There is head of all the institutions.

It is surprising that there is 27km high mountain on the planet mars. This is because of low g-value and dry rock mass conditions there. Further there are rocky surprises on all the planets. In-situ tests will prove the truth how engineering properties of soil and rock masses are different on moon and mars. Dilatometer tests may be conducted inside the drill-holes there. Climatic conditions are vastly different on all the planets. Landslides on slopes of the moon and the mars should be studied. Rock mass will be anisotropic on all the planets, due to rock joints. We should bring soil and rock samples from other planets and their moon for test on the earth. USA is planning to send one million people to planet mars by 2050.

It is proposed to mine Helium-3 on the moon which will solve the problem of generation of electricity on the entire planet earth. It is also proposed to mine iron ore on the planet mars. Appropriate ecosystems need to be generated within the green houses on moon and mars etc. in the future. Living conditions have to be improved to make life possible on other planets. We must realize that we are very lucky on the planet earth that species have evolved and will continue to evolve to be more talented, confident, organized, efficient and highly creative. Large number of robots are needed on the moon and mars. The nature is far more beautiful and beneficial on the planet earth definitely than other planets. Titan which is moon of the Saturn has lakes, mountains and dunes. There is tectonic plate movement and possible volcanic activity like earth. Some meteorites on all planets may be older than the life of the solar system.

Space tourism is bound to flourish in the future for adventurous rich persons. Astronauts should be taught deep-breathing for 1-2 hours daily for fitness and slow genetic improvement. India has to play a very important role in survival of human race by sending them to settle on various planets. Make space research a profitable business so that it becomes sustainable. The knowledge will diffuse in proportion to its utility. Solar energy will be the future food of peoples on all the planets. The destiny of ISRO is glorious as the future in extension of the past. Destiny of Himalaya is glorious. Destiny of DRDO, army and air force is also glorious, as in the past so in the future.

Truth is God, as truth serves all the religions, nations, moons and all the planets. Yet God is far more blissful than all the scriptures, science books and everything else. Thus the nature has healing properties. The time has the healing properties certainly. So cheerfulness will reduce the infighting between the scientist and religious persons. Knowledge is constantly evolving. As only the science attracts the noble souls. The useful knowledge is almighty. It is proved by the spectacular progress in the science and technology in 21st century. The technological revolution is a boon to us. Science and technology can protect all the religious and cultures etc. Only protected and innovative nations can rise. Only creative, fair and healthy global competitions can reform naturally all the nations into the creative space-age nations. Convert the crisis into an opportunity.

The laws of the nature are non-linear. The data is of eternal importance. Theories keep on evolving with time. The principle of uncertainty is teaching us risk management. But motivate those scientists who have failed as they need it most. Truth is proving to be an inspiring God. Hence no nation can rise without education of science and technology as in the past, so in the future also. Success of ISRO is due to the vast team spirit of the scientists. Therefore meritocracy is better than democracy. Teachers should teach the differences between facts and fictions. If the scientists and engineers play out-door adventurous sports, they can develop their creative leadership abilities. Then transform the challenges into the opportunities. ISRO should be ready for the space wars. Life is not possible without meritorious persons. The technocracy is better than the meritocracy which is better than the democracy.

Everything is ideally predestined in the universe on large scale and in the long time. There are always long term cyclic trends in all the society. Yogis can “see” the film of the future by their third eyes on their foreheads, during very deep meditation. They have predicted that India will regain its princetine glory in a few decades. Our inner joy will revolutionize very slowly the whole world. India is already the fastest growing nation in the whole world due to grace of God. The scientists and engineers will solve all our problems in the future as in the past. People who love India will come. Inspire your mind to become devotee of blissful God. Scientists should meditate on heart for experience of bliss. Sufferings help us to find bliss deeper within us.

The dynamic harmony is the law of the entire universe on a large scale and in the long time. Hence dynamic harmony should also be the law of all the species. There is dynamic balance between

negative energy and the positive energy in the entire universe. Cyclic blooming is the law of life. Inner joy is beyond all the laws of the nature. The top scientists are therefore optimistic. Scientists should remove fear from the minds of the people. Spirit of the science should be preserved. India will bloom one day. Technology has really unites the world.

Change the cause, and the effect follows automatically. For example doctor gives us medicine which cures us automatically. Listening to our pure conscience is the root cause of success in majority cases. Team spirit is essential for big success. Inner joy is the root cause of the team spirit. Bigger the team “bigger is the success”. Practice makes a team perfect. International cooperation is the need of the time. The noble character development is the ultimate goal of life for everyone forever. Students should excel their teachers. Those who change with times, rise with time. Be original, be brave. The efficiency of the scientists is seen to evolve fast with time due to the law of negative change in bio-entropy. Let us not waste the talents.

The scientists love the nature. We enjoy the nature because joy comes from deeper within us. Experience of the universe is incomplete without the experience of blissful God deeper within us. Bliss is the food of our souls, which money cannot buy. Inner courage is better than bliss. Introvert is always happy. If India respects the whole world, India will get respect from the whole world. It is wrong to believe that mind cannot be blissful. God is giving bliss to our mind, our goal of life should be at least to give peace to the minds of the peoples. The character development is the ultimate goal of life by doing noble actions according to one’s own pure conscience. Bliss is our inner destiny. This is the eternal inner truth. Blissful God is the cause of smiles on our faces. There is out-of-universe happiness also. There is out-of-universe bliss too. We should be a good receiver of God’s grace. Bliss of God is topmost.

The business of the medical services will be about 100 trillion US dollars in 30 years in the whole world. Hence the medical business alone can make India the richest nations of the whole world. Yoga therapy can cure about 100 diseases permanently. The nature has healing properties. Maximize the profit-loss. Please increase your opportunities and the strengths. Please decrease your threats and the weaknesses. The reliability engineering is actually an experimental science (i.e. the improvement in the technology). The nature is creating happiness. So India will also bloom slowly, automatically and cyclically. More efficiency of men and machines mean more money. The both productivity and production are good for more money. More fame means more money. *Better management means more money.* The nature needs to be healed.

The adventurous sport-persons are bringing a great name and fame to India. As the adventurous sports create the creative-leadership abilities in the sports persons. As such the adventurous sports create the creative-leadership abilities in the sport persons. As such the adventurous sports and yoga universities will solve the crises of courageous-creative leadership all over the world. Listen to your own pure conscience. Act on it. This is the law of success. Hence the destiny of sport-persons is excellent.

- Prof. Bhawani Singh
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