

ROCK MECHANICS – QUO VADIS?

The ascent of rock mechanics, as a distinct discipline in the past six decades, has had a distinctive impact on rock engineering embracing a wide spectrum of activities in civil, mining, petroleum engineering and in underground space technology. Rock mechanics emerged as a second cousin of the venerable discipline of soil mechanics, only with the publication of the first standard text on the subject by Obert and Duvall in 1967. Since then, a spate of international conferences and hordes of textbooks, the formation of International Society for Rock Mechanics, and with multidisciplinary inputs from a wide variety of disciplines have given credibility and recognition to this new engineering discipline. Rock is distinctly different from other engineering materials and when we construct structures in or on rock mass, we are dealing with a natural material of infinitely changing complexion, whose properties cannot be readily defined or encapsulated. In fact, bridging the divide between rock substance properties and deriving the rock mass properties continues to be an academic challenge of no mean a dimension for the rock mechanics practitioner. Different disciplines have laid their claims on this discipline (with miners taking the lead) and its emergence as an interdisciplinary subject area has opened up new vistas of collaboration between engineering geology, civil and geotechnical engineers, petroleum engineers and mining engineers for wrestling with a wide variety of problems in the broader domain of geomechanics.

While rock mechanics has certainly come of age in the past two decades, and refinements and new insights continue to emerge, rock mechanics applications in Indian sub-continent still suffer from issues of knowledge management. There are well-established national laboratories dealing with the subject; there are several academic institutions with excellent infrastructure and faculty too who have contributed to the discipline seminally. Yet there are no forums to pool and collate the developments in India on an annual or bi-annual basis. This writer had taken the initiative in hosting the First and Second Symposia on Rock Mechanics in India in early 1970s; however, the initiative was not continued and we do not have such conferences in India any more which could allow of free interchange of experiences amongst rock mechanics practitioners to validate new ideas and provide sound and unbiased judgment to get at what is truly important. New and exciting opportunities for innovative application of rock mechanics have opened up of late in areas such as tunnelling in metros, nuclear repositories, gas and oil storage structures, recovery of coal bed methane and sequestration of carbon dioxide underground where expertise is required from the national knowledge pool.

Much remains to be done nationally to coordinate R & D in the area of rock mechanics, pooling available knowledge and data bases, so that fragmented efforts could be channelised for the greater good of rock mechanics practitioners. Likewise, we need to

document and disseminate case studies in diverse areas of rock mechanics applications. Ideally, we need to set up a National Committee on Rock Mechanics with the support of the Department of Science & Technology, or the CSIR to oversee such a national initiative. Indian Society of Rock Mechanics and Tunnelling Technology has rendered useful services to the development of rock mechanics in India, but the effort needs to be enlarged manifold. A web-based monthly journal on current developments in rock mechanics could be of great help in knowledge management.

Prof. A. K. Ghose
Ex. Director
Indian School of Mines University
Dhanbad, India