

FOREWORD

In an era where the standards and parameters for socio-economic development and prosperity are being dynamically shaped, continued scientific research is perhaps the only constant that lies at the heart of sustainable development and progress. Scientific research is the cardinal tool for human-beings to know and make use of nature. Its various types help play a distinct, yet overlapping role in the continuous uplift and betterment of mankind and its livelihood. In this context, the leading role of basic research, is momentous in creating new knowledge and providing scientific capital.

Basic or pure research is the extension of scientific and technical knowledge, not having any industrial and commercial intentions; it is the attempt of a researcher to access the frontiers of knowledge for the sake of knowledge alone. Nevertheless, it is the knowledge that basic research creates, which provides the intellectual material for formulating the applications that we today call technology. Without doubt, basic research lies at the heart of nearly every major discovery, known to us today.

It is no secret today that basic research, whether performed in scientific laboratories, R&D institutes, universities or within industry itself, has been critical in promoting nearly all sciences whether basic or applied. The knowledge-domains of physics, chemistry and other subjects are undergoing a metamorphosis, reflecting the dominance of inter-disciplinary unification, with the borders between the traditional research-areas being eroded and the continual merging of basic research and industrial applications. The inter-locking of basic discovery and technological innovation has today led to the emergence of chemical, engineering, electronics and transportation industries, as well as the many industrial uses of nuclear radiations, besides others.

Today, it is even more true than ever that basic research is the pacemaker of technological progress. Therefore, it must not be taken as a peripheral activity, but should be given due support in order to strengthen the industrial base for achieving development and progress especially in the developing countries.

To highlight the integral link between basic research and related industrial uses, COMSATS organized a meeting on “Basic Research and Industrial Applications” from 06 to 08 July, 2004, in collaboration with Chinese Academy of Sciences (CAS) and Islamic, Educational, Scientific and Cultural Organization (ISESCO). It further aimed at ascertaining the importance of basic research as one of the pre-requisites for innovation, which is essential for companies and nations, to remain competitive in the global village of today.

There were a total of 33 speakers in the meeting who made presentations in 7 Technical Sessions, of these 5 were foreign experts representing the countries of Switzerland,

United Kingdom and China. Other participants included eminent researchers, heads of S&T institutions, scholars, students and representatives from some major industrial concerns. The proceedings of the meeting presented here comprise a selection of papers and the recommendations, at the end, which emerged during the conference.

I would like to express my gratitude to Prof. Sixiong Zhao, Executive Director, International Centre for Climate and Environment Sciences (ICES), Institute of Atmospheric Physics, Chinese Academy of Sciences and to Dr. Faiq Billal, Director, Islamic, Educational, Scientific and Cultural Organization (ISESCO), for their sincere cooperation and support in organizing this meeting. I would also like to acknowledge the efforts of Dr. M. M. Qurashi, Mr. Irfan Hayee, Ms. Zainab H. Siddiqui, Mr. Imran Chaudhry and Ms. Nagina Safdar from COMSATS, whose dedication made possible the publication of this book.

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