

**The Digital Divide: Facing a Crisis or Creating a Myth?** Benjamin M. Compaine (ed.). MIT Press Sourcebooks, MIT Press, Cambridge, Massachusetts 02142, USA. 2001. 357 pp. Price not given.

For a very long time the nations of the world are divided on many grounds such as geographical, political, economic, ethnic, racial, culture and education. In addition to these divisions, in the recent past there have been divisions on the basis of 'Haves' and 'Have nots'. This division is with respect to technology, information, communication and knowledge. With the rapid developments in technology, especially telecommunication and information, the new divide that has been much talked and written about during the last five years or so, is the 'digital divide', one on the basis of those having access to digitized information and those not having access. Digital divide is claimed to be widening the gap between 'information-rich' and 'information-poor' countries. The gap is becoming more and more of concern to the developing nations, as we are now in a knowledge society and nations are at the cutting edge of gaining access to information produced and communicated through different channels.

The book under review presents a picture of the prevailing situation with regard to digital divide in the United States. Majority of the 20 articles grouped under five chapters are reprints of earlier works published in magazines and newspapers and reports from the National Telecommunications and Information Administration. The findings and the implications of these are discussed in the remaining articles. These deal with the history, measurement and policy implications of the 'digital divide' between those having access to the recent technologies and those who do not.

The first chapter entitled 'Set up: Documentors of the digital divide' includes three articles, two of which are the reports prepared by the National Telecommunication and Information Administration. The first, a report published in 1995 entitled 'Falling through the net: A survey of the "have nots" in rural and urban America' gives statistics of the percentage of US households with a computer and a modem, among different income groups (in rural, urban and central-city areas), different races/origins, different

age groups and educational attainments. The findings reveal, and not surprisingly that the lowest telephone penetration was among the poor in central cities and rural areas, and also among the young (25 years or under) and rural senior citizens (55 years or older). The second report published in 1999 (based on data collected till 1998) entitled 'Falling through the net: Defining digital divide' updates the report published in 1995; it is found that, overall, US households are significantly well connected by telephone, computer and internet than the findings of the 1995 survey. One important conclusion of significant merit and consideration by countries falling into the group of 'have nots' is, to quote from the book, 'The 1998 data also underscore the importance of Administration's efforts to ensure that all schools and libraries have affordable access to the Internet. Under the E-rate programme (a Federally-managed program), telecommunication carriers are providing eligible schools and libraries with a discounted rate for telecommunication services, internal connections among classrooms, and Internet access. As a result, the E-rate program is helping to connect more than 80,000 schools and libraries and is enabling children and adults to both learn new technologies and have new points of access'. The third article traces the evolution of digital divide and examines the relationship of race to Internet access and usage over time.

Chapter two entitled 'The context: Background and texture' comprising four articles deals with information, gaps access to on-line services, telephone penetration in a particular area (Camden) and the concept of Universal Service which refers to making available to the extent possible, to all people of the US, an efficient nationwide and worldwide telephone and radio communication at reasonable cost. The existence or otherwise of information gap is discussed from many points of view. It is mentioned that the information gap or knowledge gap issue is perceived by the academic community. The usage of telephone, electricity, computer in schools, radio and television has been shown to have gone up and the cost of the same has come down between 1950s and 1990s. The role of public policy has been brought out with examples. It is indicated that the type of government action that might be taken, if any, is not consistent or obvious across techno-

logies. Regarding setting of priorities, it is suggested that there are other aspects of society which are equally or more important than setting right the perceived digital divide. To quote from the book, 'All kinds of gaps already exist but are rarely discussed in these terms. Most of these gaps are related to economics. The issue is not one of information or knowledge gaps, anymore than it is one of a protein gap or transportation gap. We don't read op-ed articles proposing to close the steak gap or the automobile gap. Societies need to examine what is really important and then attempt to figure out how to provide it'. This is perhaps a major issue before developing countries specially where disparities are very wide concerning the availability and usage of basic requirements, and using the latest technology.

The United States Telecommunication Act of 1996 which dealt among other things with opening markets to competition and including for provision of local phone service to consumers has been reviewed with reference to digital divide in the third chapter. It is pointed out that the Act and its implementation are contributing to the digital divide. The working of the federally-managed programme (called E-rate) that provides significant discount on telecommunication technologies to schools and libraries in USA and the impact of E-rate funding on four school districts is described in detail in this chapter. It mentions that the funding has resulted in acceleration of network infrastructure deployment and has enabled school districts to leverage existing financial resources. The starting and rapid growth and unique qualities of electronic mail (e-mail) have been traced in yet another article. Its universal access and societal implications are discussed with a conclusion that the democracy in the nations of the world is positively correlated with interconnectivity.

Chapter four on 'Reality check' deals with disappearance of the digital divide to a great extent and data from three empirical studies have been presented. These studies indicate that there are some demographic differences in Internet access, a few differences in Internet use, with the digital divide narrowing. It is also mentioned that the persistence of the belief that such gaps exist is due to misleading by the stereotypes, misinformed about survey techniques, and well-meaning but misdirected interest groups.

Much of the blame is put on the media as not always reflecting the latest trends.

Chapter 5 wraps up the issue of digital divide with articles on gaps by which democracy is measured, and how current information is drowned by the media with old and stereotyped studies. In his article, Compaine, the editor of the book, discusses the costs to the consumers for access to information and presents data for monthly and capital costs of traditional media during 1999–2000 (books, newspapers, magazines, cable TV) and capital and operational costs for Internet access during 1999. Based on the National Telecommunications and Administrations Report released in 2000, it is concluded that from the data presented, the overall level of US digital inclusion is rapidly increasing and groups that have traditionally been digital 'have nots' are now making dramatic gains.

Though the book deals mainly with the status of digital environment and its related issues in USA and is more relevant to that country, a lot of statistical information of interest is provided. Apart from being helpful to planners in other countries, it would certainly be useful as a model to those carrying out similar studies (individuals, non governmental and government agencies).

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**Symmetry in Mechanics – A Gentle, Modern Introduction.** Stephanie Frank Singer. Birkhauser Verlag, P.O. Box 133, CH-4010 Basel, Switzerland. 2001. 216 pp. Price: S Fr 58/DM 76.

Classical mechanics is the oldest discipline within physics, tracing its origins to no less than Galileo Galilei and Isaac Newton. As is well known, in the evolution of Newton's ideas the three laws of Johannes Kepler on planetary motions played a crucial role. Over the centuries the mathematical formalism of classical mechanics has witnessed many developments and elaborations, and this has continued until even very recent times. While

this subject may not seem as philosophically profound as quantum mechanics, the richness of its formal structures is quite amazing and truly beautiful. Many of these developments have come over the past three or four decades, well after the establishment of quantum mechanics. Concepts such as symplectic manifolds, Hamiltonian flows and vector fields, symmetries as Lie group actions and the associated group orbits, the momentum map and the method of symplectic reduction have gradually entered the physics scene and physicists' vocabulary, even though originally pioneered by the more mathematically minded.

The aim of this short, clearly written and lucid book is to lead the average (US) undergraduate student of physics as well as of mathematics through these developments using the simplest of possible examples and in ever so gentle a fashion. The backdrop is the derivation of Kepler's Laws from Newton's equations of motion supplemented with his Law of Universal Gravitation, for the case of the two-body problem. This so-called Kepler problem of classical mechanics is solved at the start of the book in the familiar physicist's manner by passage to the centre-of-mass frame, and then the reduction to a purely radial problem. Naturally the conservation of total linear and angular momenta is exploited. By the end of the book this same problem is tackled using the machinery of symplectic reduction.

Along the way the author builds up, in short chapters brimming with (partially solved) exercises, a series of increasingly sophisticated concepts – manifolds; vector fields, forms and their wedge product; the pull-back idea; the physicist's phase spaces reinterpreted as symplectic manifolds, with examples; Hamiltonian vector fields and the power of the Hamiltonian in supplying a useful constant of motion as well as leading to the canonical equations of motion; symmetry operations of a given system realized as actions by Lie groups; special features of Lie group actions on symplectic manifolds leading up to the beautiful notion of the momentum map; and some material on (matrix) Lie groups and Lie algebras. At the end, the Kepler problem is taken up again, and solved using the technique of symplectic reduction. The two Lie groups most often used as examples to illustrate various aspects are the abelian three-dimensional translation group, and the

nonabelian three-dimensional rotation group; however their combination in a semidirect product to form the Euclidean group is not attempted.

This book seems ideal for self-study. It is written from the viewpoint of a mathematician, but is valuable to a student trained in physics as well. There are frequent and generally amusing comparisons of the styles and temperaments of physicists on the one hand and mathematicians on the other – interest in the special features of the particular as against generality; practically gay abandon as against caution; use of infinitesimals versus proper derivatives, and so forth. The Lagrangian approach is not brought in at all, and the physicist's term 'canonical transformation' is also avoided. It may have been useful to say that the Cartesian product of two linear vector spaces is also known as their direct sum. There is frequent reference to the more or less standard undergraduate curricula in physics and in mathematics (in US colleges); and the examples chosen to illustrate the text are quite elementary. Lastly, it would be good to remember that Sophus Lie (like Abel) was a Norwegian, not a French, mathematician.

All in all a nice little book which accomplishes well what it sets out to do.

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**A Passage to Himalaya.** Harish Kapadia (ed.). Himalayan Club, Oxford University Press, Delhi. 2001. 351 pp. ISBN 0195657748. Price: Rs 500.

**Himalayan Journal.** Harish Kapadia (ed.). Himalayan Club, Oxford University Press, Delhi. 2001. vol. 57. 292 pp. ISSN 0195659805. Price: Rs 500.

If Forster's *Passage to India* (1924) was a fiction built upon the facts of the early 20th century India, *A Passage to Himalaya* is a selection of factual stories and articles that sound like adventurous fiction. Take, for example, the following