

sense of clarity of thought combined with an equally strong sense of commitment and overlaid with the deep power of his thinking runs through the entire book. One sees that Crick possesses that all-important but dismayingly elusive knack of distinguishing what is significant from what is not. His confidence in the power of structural chemistry to unravel the functioning of biological molecules is unflagging. At the same time, warning signals sound constantly to keep possible evolutionary arbitrariness in mind. Both text and photographs give the impression of a gregarious personality who enjoys life as much as he enjoys doing science. A lightness of touch is present all along—no trace of ponderousness, no attempt at heavy philosophising. But there is self-assurance of a high order. On more than one occasion one is made to sit up with the thought that *this* is what Watson must have meant when he wrote his famous opening sentence in *The Double Helix*, but on the other hand, one feels strongly that the immodesty, if that is indeed how it appeared to Watson, was entirely justified. After all, the role of Francis Crick in the rise of molecular biology was both unique and unsurpassed.

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Advances in condensed materials

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The eighties have been witness to spectacular advances in condensed materials. If the discovery of quasicrystals in 1984 revolutionized our scientific understanding of the solid state, the discovery of high-temperature superconductors in 1986 promises technological advances of an unprecedented kind. This elegant volume under review captures the spirit of some of these advances through seven articles.

T. R. Anantharaman has written on 'New light alloys and composites through

Rapsol technology'. Over a quarter century ago, he returned from the laboratories of Professor Pol Duwez and laid the foundation for the development of science and technology of rapid solidification in India. Though the tale has been told before, it is always refreshing to read how the employment of high rates of cooling of the order of a million degrees Kelvin per second bring about metastability in alloys. This paper reviews development of aluminium, magnesium and titanium alloys as well as metal matrix composites.

In the second paper, P. Ramachandra-rao describes one particular metastable effect, namely the extension of solid solubility achievable through rapid solidification. He elucidates the thermodynamic and kinetic considerations and gives a particularly succinct description of solute trapping.

Quasicrystals were discovered just over five years ago by D. Shechtman and coworkers in rapidly solidified alloys of aluminium and manganese. They display crystallographically forbidden symmetries such as five-fold rotational axes and have thrown a major challenge to our understanding of the atomic configuration in the solid state. The Banaras school has made impressive contributions to this new and exciting field by synthesizing a new class of quasicrystals based on Mg-Zn-Al alloys. In their article on 'Quasicrystallography', Shrikant Lele and R. K. Mandal present an interesting and rigorous description of this subject. Higher dimensional periodic lattices give rise to quasiperiodic lattices in lower dimensions. The projection formalism is developed in a systematic fashion and used to illustrate their own outstanding contributions to the development of decagonal quasicrystals and vacancy ordered phases by projection of non-cubic lattices from six dimensions.

D. Pandey, V. S. Tiwari and A. K. Singh have chosen to deal with just one high-temperature superconductor, namely $\text{YBa}_2\text{Cu}_3\text{O}_{7-y}$. They describe the orthorhombic structure and draw attention to the occurrence of CuO_2 sheets as well as the Cu-O chains. Subtle features such as ordering of oxygen atoms, microtwinning and ordering of planar extended defects are emphasized. The paper also brings into context their own contributions of X-ray line profile analysis of ceramics prepared by a semi-wet or conventional route.

The phenomenon of polytypism has been a major research area of the Banaras school of physicists for over three decades. The pioneering researches of A. R. Verma and P. Krishna are well recognized for structural modelling and refined X-ray investigations. In D. Pandey's continuation of this tradition X-ray studies of the transformation among close-packed structures have been addressed. V. K. Kabra, representing the next generation of research scholars has written a powerful paper along with D. Pandey on the 'Kinetics of solid state transformation using Monte Carlo simulation studies'. They show that the 2H to 6H transformation in SiC can be successfully modelled using Kawasaki dynamics. In addition they stumbled upon a new state where long range ordering can occur without short range order correlations. It is to be hoped that the authors will further elaborate on this topic.

In a brief contribution, Lakshman Pandey describes the design of a sample probe for pulsed NMR studies on piezoelectric materials.

The final paper by Yashwant Singh is an exposition on the density-functional theory of freezing and the properties of ordered phases. It follows the innovative approach initiated by T. V. Ramakrishnan and M. Yussouff and applies it to the freezing of simple and complex fluids as well as glass transition.

In just under 150 pages the authors have covered a fascinating range of topics. All the articles are written in an authoritative fashion. The editors had indicated that they embarked on two experiments in fashioning this issue: the use of desk top publishing and the development of a focal theme. The appearance of the issue is pleasing and the focus is maintained. The Kulgeet rejoices that the Banaras Hindu University is the capital of all knowledge. It is to be hoped that future issues of the journal, will focus on other areas, where the Varanasi scientists have made prominent contributions. Indeed this thematic issue can serve as a model for publications brought out by other Indian universities. The editors are to be congratulated for their accomplishment.

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