

that universities are the institutions to remedy this deficiency is another matter. Niblett believes that they are, and the value of this thoughtful essay is that the reader must decide whether he accepts Niblett's belief or not.

His diagnosis of higher education (he has in mind particularly Britain and America) is that it has tried to break away from the pursuit of narrow specialisms, and has failed. Liberal studies, joint honours schools, the redrawn 'map of learning' in the new universities, the Harvard red book on general education: all have led to disappointment. The causes of disappointment include the inflexibility of discipline-oriented teachers, the persistence of competition in examinations, the lure of professionalism, and pedantry among those who teach the humanities. "The choice before the humanities is clear: either to pretend to be sciences or to acknowledge without shame the experiencing and imaginative elements within any essential study of them." The word 'feelings' occurs often throughout the book; feelings must be recognised, identified, and incorporated into the academic experience.

In his courteous and gentle way, Niblett makes some highly controversial assumptions which some of his readers will challenge. First, are we really between two worlds? Is this a watershed similar to the great divide between Galileo and the Schoolmen? Many will question this assumption. The scientific approach to nature and to man still succeeds superbly in answering scientific questions; it was never designed to answer other sorts of questions. Nor are the other sorts of questions novel, needing new techniques. As Niblett himself suggests, you do not "decide to love or trust another human being"; so case studies in decision making (a popular form of broader education) do not embrace some of the essential human activities. But societies have been concerned for millennia with love, trust, and the whole spectrum of moral values.

The burden of Niblett's message is precisely the same as Walter Moberly's, written 25 years ago, and it is a response to the same dilemma. The only difference is that in 1949 only dons appreciated the dilemma; today students appreciate it too. The dilemma is that universities, in common with madrasas in the muslim world and the ancient Buddhist seminaries of India, have for six sevenths of their history been religious institutions, resting on a foundation of faith, commanding a consensus of values. It is only since University College, London, was founded that the formal link between faith, morals, and learning was broken. Both Niblett and Moberly believe (though they approach the issue from

different directions) that universities should adapt themselves to the consequences of this severance. But some readers will ask: should they? There surely is a case for differentiation of functions among institutions. When the church tried to meddle with science in the 19th century, it was religion, and the sensate culture associated with it which suffered. If the universities now try overtly to meddle in the non-cognitive sphere, important as it undoubtedly is, is there not a risk that they will prove incompetent (professors are no longer elected on grounds of virtue or wisdom) and that the university's unique function, to teach the art of rational analysis, will be eroded? If the purpose of the book is to stimulate reflections of this kind, it deserves to be widely read.

Niblett himself admits that there is no clear way to teach the sensate culture. And indeed some of us who are close to students doubt whether they are as impoverished in non-cognitive experience as he supposes. Not enough of them find, as he puts it, "a sense of values in an age of facts". This has not been my experience. I find more concern with moral issues, more compassion, and a livelier (if puzzling) commitment to the sensate culture among today's students than among those who were students when Niblett and I were undergraduates. I wonder whether (perhaps) they are getting on quite well, thank you, without our help. It is a humiliating admission for an academic to make after a lifetime in universities; but I, for one, would admit that despite all our anxious design of curricula and the student environment, most students get from universities not what we plan to give them but what they come to find. Over their morals and personal values we cannot do in three years what home, school, and church may have left undone in the previous 18 years. Over their adolescent intellects we can do a lot: we can open the doors of the mind.

ERIC ASHBY

Extended scope of NMR

NMR of Paramagnetic Molecules: Principles and Applications. Edited by G. N. La Mar, W. DeW. Horrocks, jun., and R. H. Holm. Pp. xv+678. (Academic: New York and London, December 1973.) \$42; £19.25.

ALTHOUGH the effects of small amounts of paramagnetic impurities on nuclear resonances of diamagnetic solid or liquid samples were discussed in some of the earliest work on NMR in bulk matter, it was not until 1956 that direct observations on the paramagnetic crystal, MnF_2 , by Shulman and Jaccarino were described and interpreted in terms of chemical bonding. Since

then it has been realised that although the powerful electronic magnetic moments in paramagnetic substances induce strong nuclear relaxation in neighbouring atoms in the same compound, the effect is often none the less weak enough to allow a great deal of the information in the nuclear resonance spectrum to be obtained. The modulation of the nuclear resonance by the paramagnetic moment turns out to be of the greatest importance, and measurements of NMR spectra of paramagnetic substances have extended in a most dramatic way the application of NMR to such diverse fields on the physical chemistry of transition metal complexes and the structures of enzymes.

Professors La Mar, Horrocks and Holm have succeeded in persuading an authoritative group of authors to set out the theoretical bases of this important area of research and to review the range of applications which have been explored up to 1973.

The first three chapters by Jesson, Swift and by La Mar, comprising about one fifth of the book, give an excellent account of the basic theory and are so clear and well set out that they will be of great value to the beginner who already has an understanding of the principles of magnetic resonance, as well as to the researcher needing a convenient summary. The chapter by Jesson sets out the theory of the paramagnetic shift, including a very clear account of the Kurland and McGarvey general treatment. This is illustrated by some examples and at the end of the chapter there is an appendix on density matrix theory. The second chapter by Swift deals with the effect of the paramagnetic moment on relaxation times. This is a very good and concise exposition of the various effects needed to interpret the spectra. In the third chapter the theory of the delocalisation of spin density is set out in detail.

The remaining thirteen chapters review the applications of these principles to an extraordinary range of chemical studies including spin distribution over organic and organometallic compounds, stereochemistry, kinetics of intramolecular rearrangements, equilibria in solution, and applications to biochemical studies. These review chapters present illustrative examples which are worked out in some detail, for an understanding of which a careful study of the first three chapters of the book is a good preparation.

This is a most valuable book for the many research workers who could make good use of measurements of this kind, though the sheer range and versatility of the problems described will be daunting to a beginner.

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