The author shows that the elimination of illiteracy needs no elaborate training colleges for teachers. At primitive educational centres, natives are trained and then go back to their villages to teach old and young to read and, what is equally important, take with them an elementary knowledge of, and enthusiasm for, improved hygiene and agricultural methods which the natives can carry out themselves with their own resources.

As the author shrewdly remarks, this method of getting the natives to carry out the development themselves and by the means they understand avoids the mistake of trying to superimpose a 'pre-fabricated' Western civilization on a totally different social and economic structure. By the improvement of environmental conditions the standard of living rises, and as illiteracy disappears there will go with it the stultifying superstitions and fears of evil spirits and local gods which need to be appeased.

Scientists and politicians might well ponder over the ultimate effects of introducing Western technology to the old civilization of the East. The first result will be a fall in the death-rate and an 'explosion of population' such as occurred in England in the nineteenth century, in which case it would be doubled in fifty years. There is no reason for believing that the Asian, even the wild man of Borneo, is innately inferior, physically or mentally, to the white man. The superior technology of the West, especially in armaments, which enabled the European nations, including the offshoot North America, to get military and economic control of practically the whole world is an open book to the Asians, who now have their own universities and research organizations. All Asia may follow the example of Japan, which within forty years of adopting Western technology became a first-class world power. As the late General Smuts pointed out, the upsurge of Asia is by far the most important political event of our day. Compared with it, European problems are of minor importance.

The most important aspect of the introduction of modern technology to the East is the raising of the standard of living and increasing the physical and mental vigour of the masses which constitute more than half the population of the world, by freeing them from the debilitating effects of disease, hunger and superstition. This development, which will profoundly affect the future of human society and which receives little attention from politicians, is being promoted by the work of the specialized agencies of the United Nations Organization described in this book, which is as readable and as fascinating as a thriller. It can be commended to all those who speculate on the shape of things to come in this rapidly changing world.

Boyd Orr

DISSOCIATION ENERGIES OF DIATOMIC MOLECULES

Dissociation Energies and Spectra of Diatomic Molecules

By Dr. A. G. Gaydon. Second edition revised. Pp. xiii+262+4 plates. (London: Chapman and Hall, Ltd., 1953.) 35*s*. net.

THE twelfth and final chapter of this second edition of Dr. A. G. Gaydon's book is headed: "The Dissociation Energies of Diatomic Molecules; Numerical Values". An extensive compilation of data follows, covering some 275 molecules. The merit of these tables lies not only in the values recommended, but also in the assessment of the probable error limits to be associated with each of the values given. In comparatively few molecules are the dissociation energies known precisely. Dr. Gaydon lists twenty-two molecules for which the error limits lie within $\pm$ 0·01 eV., and there are a further thirty-seven molecules for which the error limits are given as $\pm$ 0·1 eV. At the other extreme there are sixty-seven cases in which the error limits range from $\pm$ 0·5 to $\pm$ 2 eV., and thirty-nine cases where a question mark is attached to the recommended value. Of the dissociation energies given by the author in the first edition, published eight years ago, no less than one-third out of a total of two hundred and fifty are now altered to a greater or lesser extent.

The major revisions in the new edition are to the last four chapters, which have been largely re-written. In these the author deals with several diatomic molecules for which the dissociation energies remain both in doubt and subject to much controversy. These controversies rage most violently in the important cases—practical and theoretical—of the dissociation energies of N_2 and CO, and—in lesser degree—of F_2 and S_2. Dr. Gaydon joins combat with these issues with spirit and force, and presents his conclusions most persuasively.

I am inclined to agree with Gaydon's choice of values, $D(F_2) = 1{\cdot}6$ eV., and $D(S_2) = 4{\cdot}4$ eV. Recent evidence by Doescher[1] (mentioned, but not elaborated upon, in the book), by Haar and Beckett[2], and by Barrow[3], supports the chosen fluorine value, and the work of Sehon[4] and Porter[5] is difficult to reconcile with the alternative values (3·3 eV., 3·6 eV.) that have been proposed for $D(S_2)$. The case presented for the value $D(N_2) = 9{\cdot}76$ eV. is certainly strong, and indeed might have been strengthened further by mention of the studies of Kistiakowsky[6] on the detonation velocities in mixtures of gases containing cyanogen, oxygen and nitrogen. Nevertheless, some doubts linger, and although the author clearly wins the debate into which he enters, one feels that decisive experimental proof is not yet available.

The problem of the dissociation energy of CO is tied to that of the latent heat of sublimation of graphite, L(C). Dr. Gaydon favours the value D(CO) = 11·11 eV., and hence the so-called 'high' value, L(C) = 170·0 kcal./mole, but he qualifies his choice with the warning: "it is wise not to be too dogmatic".

Attempts to measure L(C) directly—and these have been several—have now occupied a period of thirty years. This long-standing problem is perhaps fairly to be described as exasperating, for despite careful and determined attacks upon it by able experimentalists, the answer cannot yet be quoted with certainty. But the challenge is being met with vigour, and one feels the problem can scarcely resist solution for much longer. Indeed, the latest studies (Chupka and Inghram[7], Honig[8]) would seem to expose the hub of it.

H. A. Skinner

[1] Doescher, *J. Chem. Phys.*, **19**, 1070 (1951).
[2] Haar and Beckett, Nat. Bur. Standards Rep., No. 1586 (1952).
[3] Barrow and Caunt, *Proc. Roy. Soc.*, A, **219**, 120 (1953).
[4] Sehon, *J. Amer. Chem. Soc.*, **74**, 4722 (1952).
[5] Porter, *Disc. Faraday Soc.*, **9**, 60 (1950).
[6] Kistiakowsky, Knight and Malin, *J. Amer. Chem. Soc.*, **73**, 2972 (1951).
[7] Chupka and Inghram, *J. Chem. Phys.*, **21**, 1313 (1953).
[8] Honig, *Phys. Rev.*, **91**, 465 (1953).