pilot's loss of his sense of direction, and not in any way to changed stability of the machine. Further, on p. 22 we find: "The main condition that supplies stability to aircraft is 'lift,'" a statement that surely needs no criticism! The author appears to possess a sense of humour, for on p. 13, after cautioning the reader against the erroneous expression "knots per hour," he states that "a knot is equal to 6080 ft." The photographs illustrating the work are passable, but the diagram on p. 83 is not. It purports to illustrate the trajectory of a bomb dropped from an aeroplane, but the tangent to the trajectory at the moment the bomb leaves the machine is *vertical* instead of *horizontal*! Such errors as those in the volume under review need stern criticism, as they are liable entirely to mislead the unsuspecting reader who takes up the subject for the first time. Incidentally, there is scarcely a page of the book free from grammatical error.

(2) Mr. Dommett's "Dictionary of Aircraft" is a very different type of work, and although some of the definitions are somewhat weak, the generality are good and convey a concise idea of the meaning of the terms defined. The book is likely to be most useful to the non-technical reader, as it is scarcely full enough to be regarded as a work for technical reference. There are one or two errors which need correction; the density of air is given as 0·807 lb. per cub. ft. instead of one-tenth of that amount. Under the heading "dynamic similarity" we are referred to "similarity," but no discussion of the term appears under this latter head. The definition of dynamic stability might well be expanded, as this is a term little understood by many readers of aeronautical works. Despite these few minor faults, the work should be of considerable utility, especially to the casual reader who wants a brief definition of technical terms. The price seems a trifle high for a paper-covered handbook of fifty-two pages, even in war-time!

LIQUID FUELS.

Liquid Fuels for Internal-combustion Engines: A Practical Treatise for Engineers and Chemists. By H. Moore. Pp. xv+200. (London: Crosby Lockwood and Son, 1918.) Price 12*s.* 6*d.* net.

THE rapid development of the internal-combustion engine has considerably changed our methods of power production, and liquid fuels for such engines being the most recent development, it is not surprising that their scientific study is still incomplete in respect to this method of application. The author considers it likely that the employment of liquid fuels for steam raising will entirely give place to their use in internal-combustion engines. Referring to the use of engines of the Diesel type for propelling ships, the author says that this is at present prevented through insufficient experience in building engines of very large size and of building them of low weight in proportion to the power they develop, but these difficulties, he says, are by no means insurmountable. Inexperience will be a vanishing factor, but the weight is by no means a factor to be easily overcome, being dependent on the high initial working pressures these engines require. Few engineers would care to predict the displacement of the steam turbine by Diesel engines for the high power demanded in modern battleships of even moderate size. Indeed, on the American coast there have been already cases where Diesel engines have been displaced by steam.

The liquid-fuel engine has, however, established itself firmly for a number of purposes, and the extension of the use of such engines has led to a serious shortage of suitable fuels. As the author points out, by suitable methods supplies can be enormously augmented, but the future development of these engines may be seriously retarded unless steps are taken to provide additional amounts. He instances the heavier grades of petrol, so that a larger proportion of the crude oil is available, the use of heavier fractions in vaporising engines, and the use of coal-tar products in Diesel engines

The book is divided into three parts, the last section, which comprises nearly one-half, dealing entirely with methods of examination of liquid fuels, embodying the author's experience in the laboratory of one of the largest firms of Diesel-engine manufacturers. This section will prove of considerable value to chemists engaged in fuel work.

The first part deals briefly with the raw materials which furnish the different classes of fuel—petroleum, coal tar, shale and lignite oils, etc. Part ii. deals with the fuels classified under the three types of engines in which they are applicable; those fitted with carburettors (petrol motors), those fitted with simple vaporisers (paraffin motors), and those of the Diesel and semi-Diesel type, which are fitted with fuel pumps and atomising devices. Such a method of treatment is open to objection, for many fuels are applicable to engines of more than one type—kerosene, for example, to each type. Necessarily this method leads to considerable overlapping.

Throughout the book generally there is evidence of the author's practical familiarity with the various fuels and the important characteristics to be considered in their examination. The volume will prove a serviceable guide to engineers and chemists interested in this rapidly developing phase of the fuel problem.

OUR BOOKSHELF.

Educational Reform. Speeches delivered by the Rt. Hon. H. A. L. Fisher. Pp. xvi+101. (Oxford: At the Clarendon Press, 1918.) Price 1*s.* net.

THE President of the Board of Education, who has by common consent done so much to stir and enlighten the public interest in the cause of education by his numerous addresses in all parts of the country, has wisely resolved to issue in this cheap and accessible form a selection of his principal speeches, two of which he delivered in the House