by trigonometry, and elsewhere the avoidance of explicitly stating the Weiss Zone Law leads to an unnecessarily lengthy proof that three stated faces lie in one zone.

There is one example of unnecessary complication, namely, where a ruler construction is employed to find the opposite of a stereographic pole when a pair of compasses could step off the required point along a diameter. The more lengthy ruler construction would make sense if it were used for its proper purpose, that is, finding the opposite pole *outside* the primitive, and using it together with a third pole to define a great circle. But this important construction is not mentioned.

Unfortunately, there are a fair number of other errors, among them: the body-centred cubic arrangement is treated under the heading of close packing; inversion axes cannot all be described as stated in terms of other symmetry elements; c/b is not given by tan (001):(011) for the monoclinic system (the diagram is incorrect); amosite is not an anthophyllite; the conventional brackets around Miller indices have been omitted throughout. A number of misprints are present, but are usually sufficiently obvious not to be misleading.

Two noticeable omissions are, one in the optics section where there is little mention of the relation between extinction angle and symmetry, and another in the description of the feldspars where there is no mention of the schiller effects in moonstone, peristerite, and labradorites, although the schiller phenomenon is mentioned generally elsewhere in the book.

The author has employed S.I. units throughout, including nanometres for cell dimensions (with one lapse) and meganewtons/m^2 for pressures. In the latter respects, he is ahead of the specialist literature, in which Å units and bars are still prevalent.

In summary, though in my opinion not quite up to B.Sc. degree standard, this book comes considerably nearer to being so than others which could claim similar breadth. Since it is the first British book of its kind it also gains topicality for British use by including more of the prominent British mineral localities. Unfortunately, it is somewhat marred by certain omissions and by a fair number of non-trivial and trivial errors. Some of these errors are by way of a penalty paid for an otherwise commendable attempt at simplification.

J. ZUSSMAN

MASON (BRIAN), editor. *Handbook of Elemental Abundances in Meteorites.* New York, Paris, and London (Gordon and Breach Science Publishers), 1971. vi+555 pp., 62 figs. Price, cloth £14·60, paper £5·80.

An authoritative review of the abundances of the elements in meteorites has long been a desideratum for cosmologists, meteoriticists, geophysicists, and geologists: the present volume goes a long way to meet this need, and will be an essential tool in those studies and a mine of useful information. It is, however, disappointingly uneven, and, in the future edition that will certainly be called for, a number of changes and additions could advantageously be made.

Each element (the lanthanons counting as one) is accorded a separate chapter, resulting in a certain amount of repetition, but making it easier to extract the information on any one element. The twenty authors or teams among whom the elements were

shared have not all approached the task in the same way: some give a full and critical historical survey, while others consider that reliable results have only been obtained by one particular technique (a sentiment open to doubt), and dismiss all other data very shortly; some devote a good deal of space to the distribution of the element under consideration between the principal phases (metal, sulphides, and silicates plus oxides), others say little on this aspect. It is a pity that the fuller treatment is not accorded throughout.

Several authors note considerable variations in the abundance of certain elements in the same meteorite as reported by different workers using methods that appear unexceptionable, and refer these variations to sampling errors. As noted by Ehmann in the chapter on gold, these are often matters of a non-representative metal: sulphide: silicate ratio in the sample, and the reviewer finds it surprising that no one seems to have attempted to check this ratio by determining the highly siderophile major element nickel in the sample as well as the element under study (and if possible, sulphur as well); given a bulk analysis for major elements, a correction would be simple.

A few of the relatively minor errors and omissions noted are:

Contrary to Ehmann's view (p. 99), the error in the oxygen abundance derived from a classical meteorite analysis is relatively small—analytical errors in the oxides largely cancel out and affect the total oxygen only slightly; the major source of error in the oxygen is error in the percentage of metal, but an error of as much as 2 % in the metal content only implies an error of a little over 0·5 % in the oxygen. This chapter is certainly the least satisfactory in the book.

Copper appears to be concentrated in the taenite of common chondrites (*Min. Mag.* 1968, **36**, 855), rather than in the troilite (p. 232). And it is now possible to determine the distribution of phosphorus, titanium, calcium, etc. between the principal phases, though as yet there have been only a few such analyses made.

It is *not* particularly difficult to dissolve chromite, and its presence need cause no serious analytical difficulties; but it should be remembered that it is rarely pure $FeCr_2O_4$ as has sometimes been assumed.

M. H. H.