BOOK REVIEWS

Pichler, H. and Schmitt-Riegraf, C. (Translated by L. Hoke), *Rock-forming Minerals in Thin Section,* London, Weinheim, etc. (Chapman & Hall), 1997, x + 220 pp. Price £85.00. ISBN 0-412-64460-6.

In English-speaking countries a new elementary optical mineralogy text-book is published every few years although at this level the subject matter changes very little. Those of us who have taught this subject to undergraduates, over many years, may believe that existing texts are unsuitable for a variety of reasons; for example because they have what we consider to be the wrong emphasis to be easily understood or we may be altruistic enough to believe that our publisher can produce a book at a price more favourable to the student than the existing text books. In the present case we find the reason for the publication of the German edition of this text-book in the Preface where it is stated that "In German geological literature, this is the first short comprehensive teaching book about using a microscope in the identification of minerals for at least fifty years". It has to be said at the outset that this in itself is not a justification for an English language edition unless it has something special to offer and, looking at the recommended price, it will have to be very special.

The book is divided into three parts: Part A Optical crystallography (27 pages), Part B Optical mineralogy (137 pages) and Part C Appendices (44 pages). The optical crystallography section is shorter than in similar books and it was disappointing to find an error in the second page of the text where the numbers engraved on the objective lenses are explained. It is stated that the 160 means that "the achromatic objective has a free working distance of 160 mm". This is clearly incorrect, as the student can easily verify because, if the objectives were supplied with the microscope, they will each display the same figure of 160 mm because it refers to the tube length with which the objective should be used. On page 3 we are told that the different light paths for orthoscopic and conoscopic observations are shown in Table 1, but it shows nothing of the sort.

The description of the use of the Becke line could be misleading since the assumption made is that all microscopes are focused by adjustment of the position of the stage and we are not informed of this. However, my main criticism of this part is that we are told nothing about the measurement of refractive indices and the problems associated with this operation: the immersion method is not even hinted at. Extinction is briefly mentioned in Part A but we have to look in Part B to find an explanation of the method of measuring extinction angles in pyroxenes and amphiboles — unfortunately completely incorrect (see below). There is mention of the universal stage in a few places in the book but no information on what it is.

Two expressions which are not acceptable are 'uncrossed polarizers' and 'crossed polarized light' – the first because it is intended to imply plane polarized light and the second because there is no such phenomenon as 'crossed polarized light'.

The discussion of the formation of interference colours is much too brief to give a satisfactory explanation of the appearance of Newton's scale of colours. In Part B the descriptions of the minerals in thin section are arranged as follows: opaque minerals, isotropic minerals, uniaxial +ve then −ve and finally biaxial minerals. For each mineral there is a drawing of an ideal crystal with the indicatrix axes and the optic axes where appropriate, together with a list of its optical properties and occurrence. There is a black and white photograph for most minerals and there are eight pages of colour plates of the minerals: the colour photographs are of very high quality and the anomalous blues and browns of vesuvianite are very well reproduced. The black and white photographs are of variable quality and usefulness in aiding identification.

As noted above, extinction angle measurement is treated in Part B between pyroxenes and amphiboles. There are diagrams which, the authors claim, permit us to distinguish between amphiboles and pyroxenes and also between members of these groups. These diagrams were formerly used by undergraduates, but they tend to cause a false sense of security, because in the case of amphiboles very different extinction angles may be obtained from minerals of almost the same composition. However, this is a minor complaint compared with the errors in the discussion of measuring extinction angles. First of all the maximum extinction angle of most clinopyroxenes and monoclinic amphiboles is not necessarily that obtained in (010) sections but as a first approximation let us assume that it is, because usually we look for a

section showing maximum birefringence on which to measure extinction angles. It is stated in this book that the trace of the prismatic cleavage should be set parallel to the N–S cross-wire and then the stage rotated to the extinction position and the angle noted as I. The cleavage should next be aligned parallel to the E–W crosswire and rotated to the N direction until extinction occurs: the angle is noted as II. "The direction which halves the two angles I and II is the direction of maximum extinction". In the example which the authors give, I is 41° and II is 45° hence the maximum extinction angle for this crystal is 43° It makes not the slightest difference which cross-wire the extinction angle is measured from and if we adopted the procedure described here all minerals would have an extinction angle of 45°. Of course, there are two different angles which together measure 90° and the smaller of the two is usually quoted.

Part C consists of three Appendices made up of tables and diagrams. There are 22 tables in Appendix 1, the most comprehensive of which is table 7a in which the minerals are arranged in the same order as in Part B and give the same information in summary. I cannot see the need for this table. Appendix 2 contains diagrams for the classification of magmatic rocks – from this diagram it appears that the plutonic equivalent of a rhyolite is a syenogranite and of a rhyodacite is a monzogranite – there is no granite!

Throughout the text there are errors too numerous to list. In many places words are used which have largely become obsolete. There seems little advantage in re-introducing them without good reason and most of them are not defined nor do they appear in the index. Even ideas which have long disappeared appear here. For example we are told that there are "six plagioclase minerals" which was the case before it was recognized that they were members of a solid-solution series. We are told that the intergrowth plane in pericline twins is (001) in the plagioclases. "Alkali feldspars show characteristic perthitic internal textures which are absent in plagioclase" but we have already been warned about antiperthites a few pages earlier — what do they look like? It is stated that anorthoclase has cross-hatched twinning according to the microcline law. Where is the microcline law defined? I had occasion to look up the mineral melilite. Here I find the statement that melilite "is not a feldspathoid but is considered to be a desolidified pyroxene (sic) and belongs to the dark components of a rock". What is a desolidified pyroxene?

Terms which have gone largely out of common use include 'diadochy' rather than solid solution, and another is 'diaphthoritic', referring to a metamorphic rock which has suffered retrograde metamorphism. Neither grammatite nor amianthus are currently approved mineral names. There are dozens of spelling errors and inconsistencies between data in the tables and in the main text, and the index is not very good.

It is clear that some of the errors are due to the authors, although this book was translated after a second German edition was published; some errors may be due to the translator. However, the greatest responsibility for the weaknesses of this book lies with the publishers of this English language edition or their advisor(s). Why did they choose to translate this particular book and why didn't they have the translation read by a mineralogist? What justification is there for setting this ridiculous price. It is difficult to know who would wish to buy it even at a third of this price when there are a number of excellent books on this topic already available in English and they are unlikely to go out of date very much.

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Pitcher, W. S. *The Nature and Origin of Granite* (second edition). London and New York (Chapman & Hall), 1997. xvi + 387 pp. Price £55.00. ISBN 0-412-75860-1

As the nineteenth century quotation that opens this book states "Granite is not a rock which was simple in its origin ...". That this is true has been made abundantly clear to students of the subject ever since the petrological renaissance of the 1970s brought granitic rocks once again into their share of the limelight. The first edition of 'Wally's book', as it has become known, appeared in 1993 and was sufficiently popular to warrant a reprinting two years later. This is the second edition, which contains a number of refinements and additions, including discussions of some of the latest topics and controversies that have sprung up. As it lay on my desk, awaiting attention, more than one colleague at Kingston University remarked that they "must get hold of a copy". Surely this augurs well for sales of this work, which represents the author's personal views on a wide range of topics within granitic rock petrogenesis.

This new edition has a much better (and far more amusing) cover photograph than the first. It is also produced with a clearer and more attractive typography and layout. The type is larger and easier to read and there has been a general rephrasing