fascinating chemical and mineralogical variation has led to them being subjected to intensive study. In the introduction to this publication, the author points out that 'an understanding of their genesis is essential if we are to understand fully the workings of the solid earth'. He also stresses their economic importance as sources of a wide range of industrial raw materials (e.g. phosphate, vermiculite, Nb, Cu, rare earth elements). Over 2000 localities are now known, including more than 300 carbonatites.

The author compiled this catalogue of alkaline rocks and carbonatites because no world-wide survey had been available previously He has included all occurrences that could be traced in four parts, the first of which deals with North and South America. Parts 2, 3 and 4 (to be published) will deal with, in order: Africa; U.S.S.R.; and Asia, Europe (excluding U.S.S.R.), Australasia, Antarctica, and the oceanic islands.

The main criteria for classification as alkaline rocks are the presence of modal feldspathoids (including analcime) and/or alkaline pyroxenes and amphiboles. Also included are fenites, certain ultramafic and melilite-bearing rocks (e.g. alnöites), and some highly potassic rocks (but not kimberlites). Carbonatites include igneous and metasomatic types as well as some that may be metamorphic in origin.

The catalogue is arranged nationally with each occurrence being assigned a national number. Information includes: geographic coordinates; brief descriptions of complexes (including simplified geological maps), petrographic relations, principal results of some specialized geochemical studies; economic aspects; age data; references to crucial published work for each occurrence, and a full reference list at the end of each national section. A locality index cites both national number and page number.

Part 1 includes data for Canada (165 occurrences), Greenland (44), Mexico (17), U.S.A. (144), Argentina (17), Bolivia (7), Brazil (116), Chile (3), Colombia (3), Costa Rica (3), Dominican Republic (1), Ecuador (1), Guyana (3), Haiti (1), Honduras (1), Paraguay (26), Peru (4), Uruguay (3), Venezuela (2).

The catalogue is well-produced on a large page format (A4) and contains abundant factual information; the reference lists are particularly valuable. One possible problem is that the classification criteria for alkaline rocks has led to the omission of some complexes which are genetically related to other complexes which are included. Thus the Ascutney complex, Vermont, is omitted even though it is undoubtedly a member of the White Mountain Magma Series. There may be other such omissions.

The author is to be congratulated on compiling this detailed catalogue. Some of the occurrences are only reported in obscure journals and survey reports making this comprehensive list particularly useful for geologists working on alkaline rocks. Thus the full catalogue will be an essential purchase for university, survey and mining company libraries as well as for specialist workers, although the latter may eventually find the cost for the whole catalogue rather prohibitive.

C. M. B. HENDERSON

Woods, T. L. and Garrels, R. M. *Thermodynamic Values at Low Temperature for Natural Inorganic Materials: an uncritical summary*. New York and Oxford (Oxford University Press), 1987, xvi + 266 pp. Price £17.50.

In numero veritas! Since the application of thermodynamics to sedimentary geochemistry was pioneered by Professor Garrels, any compilation of thermodynamic data by him will inevitably be vested with considerable authority. In this case, rightly so. A gap in the existing provision of data has been apparent for some time, as none of the other compilations include quite the right mix of aqueous species and rock-forming minerals which is necessary for sedimentary geochemistry.

The thermodynamic data in this text is ordered initially alphabetically (by the name of the first element in the formula, not by its symbol); however, within the listing for each element, the compounds are presented in a fixed (but arbitrary?) order. The data itself comprise the formula, compound name, and state, together with values for the enthalpies, free energies, and entropies under standard conditions. The units are joules, and the sources of data are numerically keyed to a list of references. A valuable feature of the data set is that the range of values (up to 10 in some cases) found for some coupounds gives a good idea of the possible errors in estimating the free energy changes for selected reactions. These values are presented uncritically, but there is a suitable caveat in the introduction as to the dangers of using data from different sources. I will certainly use these tables regularly, and will acquire a set for teaching. They are clearly printed and are robustly bound, and the latter will prove to be a thoughtful feature in view of their potential usage. An essential buy for any serious sedimentary geochmemist at £17.50.

R. RAISWELL

Williams, K. L. *Introduction to X-ray Spectrometry: X-ray fluorescence and electron microprobe analysis*. London and Boston (Allen and Unwin),