

arrangement reasonably satisfactory. Only about 20 pages are devoted to sediments, so that the book must be regarded as dealing almost exclusively with igneous and metamorphic types. It is principally with their problems that the author has been concerned throughout his career in the field and in the laboratory.

In introducing the igneous rocks he points to lavas as the only indubitably igneous or once-molten rocks. For certain deep-seated types that have usually been classed as igneous, he suggests that some doubts should be entertained, and the implication is strong that he himself thinks that very large masses (batholiths), and therefore most granites, are not of igneous origin—a view much in vogue in these times and one with which this reviewer has little sympathy.

In his treatment of the igneous rocks the author discusses the laboratory studies of silicate melts and the equilibrium diagrams that have resulted therefrom, making good use of these in describing the crystallization of magmas. He leans strongly toward the view that the diversity of igneous rocks has arisen largely through fractional crystallization of magmas, although he does not exclude the other processes involving selective transfer of material. Here the reviewer finds himself in complete agreement, and also regards as excellent the author's discussion of the manner of occurrence and natural relationships of igneous rock types.

With the metamorphic rocks we reach varieties on which our knowledge is much more limited. They therefore present a major challenge and are at the

moment the object of much investigation, both on the theoretical side and in the field and laboratory. The possible effects of pressure and stress become of equal importance with those of temperature, which is the principal consideration with the igneous rocks.

Barth discusses, as fully as possible in this small volume, the present state of knowledge and conjecture in this varied approach to the problems of metamorphism. Possible mineral assemblages under different conditions of temperature and pressure are treated in considerable detail. It is often not sufficiently emphasized how uncertain is our knowledge. For example, in a diagram on page 255 and again in the text on page 269, a rising-temperature inversion of triclinic microcline to monoclinic orthoclase near 700° is presented as if it were an established fact. Actually nothing is known of the temperature of this change. Indeed, no less an authority on rock minerals than Eskola has recently raised the question whether microcline may not be the high-temperature modification of potash feldspar.

It should be realized, however, that such a wealth and variety of interpretation are presented that the author could not hope to discuss all the pros and cons in one small volume. It is well, therefore, to end on the note already struck, that in the hands of a discriminating teacher the book will be a valuable addition to petrologic literature.

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