might be expected; cultural diversity also extended into many facets of social and ceremonial life.

The evidence presented reinforces the current anthropological view that there is no single "Eskimo culture" spread across the vast North American continent. Rather, there are numerous "cultures" of Eskimo peoples which share some traits because of geographical or historical similarities or both and which simultaneously diverge to reflect individual local traditions.

The book merits scholarly attention and should also attract a wide audience among public administrators, teachers, and others working in Alaska generally.

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Rocks from Earth's Interior

Ultramafic and Related Rocks. P. J. WYLLIE, Ed. Wiley, New York, 1967. xviii + 464 pp., illus. $22.50.

The aim of petrology is to study the "beginning," development, alteration, intergradation, and reconstruction of rocks. According to modern views based upon experimental and theoretical thermodynamic data, geophysical measurements, and geological observation and interpretation, the ultrabasic (=ultramafic) rocks should yield new information on the nature of the deep crust of the earth. These rocks have therefore recently come into the glare of geological publicity.

The ultramafics are chemically characterized by relatively low contents of O, Si, Al, alkalis, and high Fe, Mg, Ca. Mineralogically this is reflected by absence of quartz and (most) feldspars, and by high concentrations of olivine, pyroxene, and sometimes garnet and hornblende, which are relatively heavy minerals (close-packed silicate lattices). In all respects the ultramafics form the antipole of the granitic rocks, which are high in quartz and feldspars, are specifically light, and reside in shallow depths (because they are forced upward by the gravitational field). The ultramafics abide at much deeper levels (indeed, they may, at least in part, derive from the earth's mantle) and only occasionally appear in the upper parts of the crust. As meteors are obvious messengers from outer space, the ultramafics are, on this theory, messengers from inner space, that is, from the interior of the earth. How and why these heavy rocks manage to migrate against the gravity gradient is a moot question. Are they carried upward by floating continents emerging from the depths? Or do they come from dispersed molecules and atoms slowly migrating through preexisting rock masses perhaps attached to some "carriers" (Mg-metasomatism)?

The account of ultramafic rocks presented in this book is divided into 43 chapters written by 37 authors. The many expert authors have produced variety, but also have introduced problems by overlap and gaps in the coverage. The editor has smoothed the discontinuities in several ways, particularly by writing a special introduction for each chapter which attempts to coordinate and relate the chapter to other chapters and to furnish cross references.

The large number of known natural occurrences are classified and divided into categories, and the fundamental problems are discussed. Among the diversified and complicated questions treated are the intricate relations of the layered intrusions, the minor intrusions, and the zoned complexes. Much room is given to the Alpine-type ultramafic associations. The problems are multiplied by including kimberlites and carbonatites. There is a very useful compilation of the worldwide distribution of kimberlite, until recently the only primary terrestrial source of diamonds. No satisfactory hypothesis for the origin of kimberlite can be offered; some kimberlites may have developed from fluidization systems which followed the explosion of deep, gas-charged magma.

The mafic and ultramafic small nodules, constantly found in kimberlite but also in basalt and other basic igneous rock, promise to reveal the chemical and mineralogical composition of the earth's mantle, and have been intensively studied. They are variously interpreted as representative of the primary basaltic magma formed as bottom cumulates in temporary reservoirs or formed marginally during upward flow. But eclogites, except in the form of nodules, are not treated.

There are special chapters on the geochemistry and on the petrogenesis of the ultramafic rocks. Experiments in the system CaO-MgO-SiO_2-CO_2-H_2O pertinent to the relations between kimberlite and carbonatite are explained and discussed.

A review of 12 pages on petrogenesis, on the significance of the geochemical results, and on the relations of ultramafic rocks to the upper mantle completes the text. There are about 1000 references, an author index, and a subject index.

The book is stimulating, full of facts, and extremely useful. In this short review a list of the 37 authors and the titles of the 43 chapters would have taken one fourth of the space available. I can therefore just summarily compliment each author on his logical and authoritative presentation, reliability, and clear and easy style of writing. The book is very readable, and is a must to every geologist who studies and wants to understand how defined geoprocesses may give birth to these fascinating rock products.

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Instrumental Optics

Interferometry. W. H. STEEL. Cambridge University Press, New York, 1967. x + 271 pp., illus. $11.50.

The wavelength of light is about half a micron, or one 20-millionth of an inch. It is the ideal tool for measuring small thicknesses, surface finish, or movements down almost to atomic dimensions, and the technique ordinarily used is interferometry. W. H. Steel of the National Standards Laboratory in Sydney, Australia, has now written an authoritative, concise, contemporary survey of this important field. To do so, he has had to draw heavily on coherence theory and Fourier transform relationships. Indeed, chapters 2 through 4, only 43 pages, manage to cover most of the fundamentals of modern instrumental optics, and the reader must read and understand them well, for the concepts and terminology developed there are used without further explanation in the rest of the book.

Chapter 5, on two-beam interferometers, is similarly basic, for in it the author defines significant concepts not previously sharply distinguished, even by experts: tilt, shift, shear, delay, and lead. Shear may be lateral, rotational, or radial. Using this rich and compact conceptual framework, Steel can then economically unify things which are as seemingly diverse as spectroscopy, radio astronomy, holograms, and the familiar optical interferometers. This of course means that the tricks used in each are seen to be applicable to the others.

The generality of the treatment will lead the careful reader to a deep under-