

dentist. Subsequent chapters in this section include stable isotopic compositions of biological apatite (Kohn and Cerling) and trace elements in recent and fossil bone (Trueman and Tuross). The chapter on stable isotope composition was particularly enlightening and demonstrated the breadth of applications in this field from dinosaur thermoregulation to the demise of Norse colonies based on the isotopic composition of fossil tooth enamel.

The fourth section of this book covers the broad area of geochronology of phosphate minerals. This area has seen a dramatic increase in activity with recent recognition of the widespread nature and petrogenesis of monazite as well as analytical approaches that allow for spot analyses of small grains or parts of grains. Additionally, understanding the thermal retention of He in apatite led to birth of U-Th-He dating and the blossoming of a new low temperature chronometer. Harrison, Catlos, and Montel provide the opening chapter on U-Th-Pb dating of apatite, monazite and xenotime and provide a good overview. The remaining two chapters cover low temperature geochronology, specifically (U-Th)/He dating of phosphates (Farley and Stockli) and fission track dating (Gleadow, Belton, Kohn, and Brown).

The final section of the book covers materials applications. The chapter on biomedical applications (Gross and Berndt) was a fascinating tour through what is known about apatite in the human body and the challenges of synthesizing remedial materials for bone and teeth. Ewing and Wang present a chapter on phosphates associated with nuclear waste and a concluding article by Waychunas on apatite luminescence, which again returns to the diversity of elements that can be incorporated into apatite and hence activate luminescence.

This book is a real bargain at \$40 (U.S.) and is a nice contrast to the rising prices commanded for geoscience publications by other publishers. I was impressed with the diversity of authorship as well as topic and found individual articles gave you an excellent overview of the state of research in a

particular area complete with extensive references. I would recommend this book to anyone interested in phosphate minerals and tip a hat to MSA/GS who continue to provide outstanding, affordable publications to the earth sciences world.

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