or glacial ice. The mobility of an element, or tendency for it to migrate in the surficial environment, determines the characteristics of the geochemical anomalies it can form. Water is the principal transporting agency for the products of weathering. Mobility is, therefore, closely related to the tendency of an element to be stable in water-soluble form. The chemical factors affecting the mobility of elements include hydrogen-ion concentration, solubility of salts, coprecipitation, sorption, oxidation potential, and the formation of complexes and colloidal solutions. The mobility of the elements may be further modified by biological factors.

Secondary anomalies may occur in residual materials or in materials transported by ice, frost, underground water, animals, soil-forming processes, plant activity, and surface water. Each one of these transporting agencies gives a characteristic distribution pattern to the weathering products of ore deposits.

Geochemical methods have been applied most extensively in the Soviet Union, Scandinavia, the United States, Canada, Africa, and Japan. The most uniformly successful geochemical prospecting work has been based on sampling and analysis of residual soil and vegetation; anomalies caused by movement of metals in ground and surface water show promise as an effective means of locating buried ore deposits. Some suggestions for the execution of geochemical surveys and the interpretation of geochemical data in terms of possible ore are presented.

KERR (Paul F.). *Optical Mineralogy.* London (McGraw-Hill Book Co., Inc.), 3rd edn, xiv+442 pp. Price 66*s*.

Part I (Optics) is the same length as in the 2nd edition and the chapter headings have been retained, but the text has been largely rewritten. Among microscopes the Zeiss Standard is described, but the new large Leitz models are not represented. A new chapter has been inserted, on the Universal stage (13 pp.). Conoscopic procedure and the three-axis stages are not mentioned. The four-axis stage is described with an Emmons notation, but the five-axis stage is shown with a notation which uses the well-known Berek symbols in reversed order (see Emmons, Amer. Min., 1929, **14,** 441). Since this method was expressly discarded by Emmons (Geol. Soc. Amer., 1943, 8, 13) as 're-numbering the axes, leading to tragic confusion' its revival is unfortunate; the Berek, Reinhard, and Emmons notations are established and may well suffice. A few details may need correction: p. 5; epoxy resins (A. G. King, Amer. Min., **42,** 689, 1957) are important for impregnating sections. Fig. 2.7 is much less clear than the usual diagrams of the microscope. Fig. 2.20: this mica compensator does not tilt.

Reflected light methods and polishing have been purposely omitted, and there are very few references to artificial products. The book thus retains the petrological trend of the earlier editions and will be chiefly useful to petrologists working with transparent thin sections.

Part II forms an excellent introduction to thin-section petrology. The crisp but small micrographs of the 2nd edition have been replaced by numerous good photographs, with many optical diagrams. Clay minerals are described, with some electron micrographs. References at the end of each chapter include many textbooks and monographs. The somewhat high price reflects the good quality of the production. The inclusion of a general first part follows usual practice, but it may be questioned whether these varied subjects might not now be allotted to separate textbooks.

A. F. H.

ROSE (A. J.). *Tables et Abaques.* Paris (Centre National de la Récherche Scientifique), 1957, 141 pp. Price 1500 francs.

DURIF-VARAMBON (A). & FORRAT (F.). *Tables numériques de sin θ et de sin²θ.* Centre National de la Récherche Scientifique, Institut Fourier, Grenoble, France, 1958, 26 pp. Price 250 francs.

Rose's main table (III) lists d-values for X-ray powder photographs for Bragg angles, θ, between 0° and 90° at intervals of 0·01°. Values are given for the $K\alpha_1$ wavelengths of the usual radiations (from Cu, Ni, Co, Fe, Cr, and Mo targets). The wavelengths taken (table I) are those of Cauchois and Hulubei, converted to absolute Ångströms; they differ from the usual values by not more than 1 part in 90 000, which is insignificant for most purposes. The tables are thus directly comparable, for example, with those of the National Bureau of Standards (1950, Applied Mathematics Series, 10); random checks show that they agree to the limit above.

A new and valuable feature of this volume is that table III also lists values of $4R\theta$ and $2R\tan\theta$ for each value of θ; $R = 180/2\pi$ or $240/2\pi$ applying to standard American or French cameras of 5·73 cm. or 7·64 cm. diameter respectively. $4R\theta$ represents the distance between powder lines on a cylindrical camera, and can be applied to measurements on a focusing camera; $2R\tan\theta$ gives the corresponding distance measured on a flat-film camera and can be applied to measurements of