commemorated the pioneer work in the 1890s of Professor Jules Cornet in describing the geology and mineralisation potential of the Katangan copper belt. The volume runs to 482 pages and is characterized mainly by relatively short review papers. It is copiously illustrated but the small format means that some of the diagrams, particularly maps, are over-reduced and a little difficult to read. On a positive note, field photographs and photomicrographs are generally well reproduced. As the title suggests, the main theme of the volume is the geological setting, particularly in terms of sedimentology and tectonics, for the stratiform copper mineralisation of the Shaba district with comparisons with similar mineralisation from other parts of the world. The associated mineralisation includes papers on uranium and rare earth mineralisation, kimberlites occurring in Zaire (Kampata *et al.*), platinoid minerals found with the Cu-Co mineralisation (Jedwab), and the development of lateritic bauxites in Zaire (Kaseba *et al.*). A comprehensive review paper, with emphasis on research carried out between 1950 and 1980, by Francois sets the scene for Shaba geology. Papers by Dumont & Hanon and Brown give overviews of the tectonic and sedimentological settings, with the former authors suggesting that plate tectonic interpretations of Shaba geology based on a triple junction and aulacogen are premature. The latter author takes a more global viewpoint emphasising a rift setting in low latitudes with a change from early red-bed sedimentation to grey-bed marine and/or lacustrine sedimentation and the presence of evaporitic horizons. A number of authors (e.g. Okitaudji Lokoho; Dejonghe) regard the mineralisation as polyphase beginning with syn-diagenetic events, which commonly produce early pyritic mineralisation, followed by introduction of Cu-rich brines on growth faults and replacement of early pyrite, through to late-stage epigenetic remobilisation and development of mineral bodies in fault and fracture zones. The source of the Cu-rich brines is suggested by Madi-Lugali to result from the weathering of granitic bedrock, although Binda speculates that weathering of Pre-Katangan porphyry copper deposits could provide the brine source. Other authors describe similar deposits from Morocco (Mouttaqi & Sagon), Mexico (Zarate-Del Valle), Chile (Binda) and SW Sweden (Alm *et al.*). Papers on the associated uranium deposits of the Shaba district focus on the generation of hypersaline, oxidising residual fluids, and their capacity to remobilise uranium (Cailteux). Radiometric dating of uranium deposits (Loris *et al.*) to the late Proterozoic-Cambrian appears to support the remobilisation concept. Finally there are papers dealing with exploration for uranium using quartz thermoluminescence (Makabu *et al.*), a PC-based simulation of stratiform Cu-Co district which helps students to develop exploration strategies (Bauchau) and consideration of flotation problems arising from slime coating leading to loss of metals in fines (Kalenga). Overall the volume gives an up-to-date insight into current thinking on the geology of the Shaba copper belt and stratiform copper deposits in general and gives a very good introduction and review to the extensive range of publications, in French, on this important class of deposits. H. COLLEY

Rémond, G., Balk, L. and Marshall, D. J. (Eds.). *Luminescence*. Scanning Microscopy Supplement 9. Proceedings of the 13th Pfefferkorn Conference. Scanning Microscopy International, AMF O'Hare (Chicago), Il, USA. US$ 74.00. 1995, vi + 288 pp.

The 24 papers contained within this volume comprise a snap-shot of the state-of-the-art in a very wide range of applications of luminescence to inorganic materials covering several luminescence techniques. Most of the papers, all written by leading workers in the field, may be grouped under mineralogical, solid physics or technique headings, but palaeontological, archaeological, and environmental geochemistry applications are also represented. Most papers discuss cathodoluminescence (CL) or photoluminescence (PL), but ionoluminescence is also applied in one paper. Some papers highlight novel new applications of luminescence, whilst others indicate current progress for existing applications. The emphasis throughout is on the description, detailed explanation and discussion of the fundamental mechanisms which give rise to, or exert influence on, the measured or observed luminescence phenomena. The book is therefore aimed at those with a good level of knowledge. Luminescence date are frequently presented along with trace element data collected by PIXE, EPMA or e.p.r. The volume is well presented, with full reference lists and a useful subject index. Diagrams, spectra and photomicrographs are of almost uniformly high quality.

In the 10 mineralogical papers, the fundamentals of the CL and/or PL of zircon, quartz,

carbonates, diamond and the ionoluminescence of plagioclase are presented, together with applications to zinc mineralisation, shell growth structure and mineralogy, and marble provenance determination. The 11 papers devoted to technological applications of luminescence deal with investigations of electronic characteristics of boundaries m semiconductors, quality control during semiconductor manufacture, properties of amorphous semiconductors, carrier lifetime measurement, the properties of quantum wells and quantum wires, properties of $BaTiO_3$ ceramic and properties of YAG crystals used in electron microscopy. Two papers assess the complementary nature of CL and PL and of CL and SEAM. The perennial question of a CL standard is also discussed, and the results of an interlaboratory study of a proposed zircon standard presented.

The volume stands out especially because of its emphasis on the fundamental causes of luminescence phenomena in the various materials considered. It is also valuable because of the various discussions on topics swh as intrinsic luminescence, the effects of instrumentation and beam damage. It will be of special interest and value to mineralogists, to physicists working in the fields of microelectronics and optics, and others interested in the fundamentals of luminescence processes and their applications.

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