such an improvement is desirable in an alloy which is not produced primarily for its high strength. A harder alloy would be less susceptible to smearing and gold enrichment of the surface during polishing, a feature important for display. On the other hand, less wear and deterioration of colour in the abrasive conditions of service could be expected.

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A New Text on the Applications of Gold

Gold Usage BY W. S. RAPSON AND (in part) T. GROENEWALD, Academic Press, London, 366 pages, £12

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Gold is most certainly one of the eternally fascinating subjects to read and write about. A large number of books, review articles, essays and scientific and technical papers have been published which deal with various aspects of this metal: its history, economic significance, extraction, properties, its special applications etc. Nevertheless, apart from Wise's monograph, which appeared in 1964 and has now been out of print for several years, comparatively little has been written with the aim of providing a complete and fairly detailed picture of all the more important applications of gold and its alloys. Furthermore, some trends in the use of gold have changed considerably during the last ten years. Therefore, a new book covering the usage of gold will definitely arouse a great deal of interest.

Even a very quick glance through the pages of the book by Rapson and Groenewald reveals that their work is much more than just a catalogue of the numerous applications which have developed for gold in addition to the traditional ones in coinage, jewellery, and restorative dentistry. Indeed, the title 'Gold Usage' is an understatement in that the book is a source of much more information than might be expected from its name.

The first chapter is devoted to a detailed survey of recent trends in production and consumption figures. A short second chapter deals with hoarding of, and investment in gold. Both these chapters are highly interesting, especially as some of the information given here, for instance the production figures of new gold in the U.S.S.R., is rather hard to come by for the great majority of those concerned with the use of gold. Even more valuable, however, are the contents of the following eight chapters in which the authors have succeeded in giving a comprehensive account of virtually every present-day application of the yellow metal as well as a large amount of information about why and how gold is used in each particular case. In order to achieve this, the authors had to work through a vast quantity of technical and scientific literature. Approximately 1 200 books, papers and patents are quoted, in all probability practically the complete literature relevant for the user of gold, and much of it dating from the last fifteen years. Thus the important

time span from the publication of Wise's book to the beginning of 1977 is also covered in detail. The only significant work not quoted appears, strangely enough, to be E. Raub's book 'Die Edelmetalle und ihre Legierungen'. This very complete coverage of the literature means that the book can be used as an efficient guide through the vast amount of published information on gold. In addition, most of the references are digested in such a manner that a fair insight into them is possible without the need to go back to the original sources. Another highly commendable feature of the book lies in the considerable effort which the authors have obviously made to describe complex features in such a way that even readers without any very thorough knowledge of metallurgy, chemistry and physics should be able to understand the important points. Rapson and Groenewald have produced a very readable book without over-simplification — not always an easy task in the fields of science and technology.

Some problems arise from the limitation in space combined with the wide scope of the book. One of them is that not every single application can be covered in great detail. The use of gold and its alloys in the production of electrical contacts, for instance, might have deserved somewhat more depth. However, in a book of this type, every specialist reading the chapter pertaining to his own field of activity tends to feel that some more detail would have been welcome. On the other hand one might query why the different strengthening mechanisms in some of the carat gold alloys are given a relatively broad discussion when reference to one or the other of the standard textbooks in physical metallurgy would have been more economic and just as helpful. These are minor points, however, which should not be taken too seriously. It is only fair to say that in the overwhelming majority of cases the authors have found a very satisfying balance between depth and compactness.

'Gold Usage' will be a reliable source of information for all those who work with gold or are interested in the unique properties of this metal and its alloys. It is carefully researched and well written. It makes fascinating reading, which is about the best that can be said of any book.