
BOOK REVIEWS

Gold in Antiquity: From the Mine to the Object

L'or dans L'Antiquité, de la Mine à l'Object', edited by Beatrice Cauet, Fédération Aquitania, Bordeaux, 1999, 496 pages with 410 illustrations (115 in colour), ISBN 2-910763-03-X, Price 300 FF

This volume has its origin in a conference of the same title which took place in Limoges, in the gold-rich area of South West France, in 1994. As a result, many of the authors come from France and focus their contributions on sites in France, and most of the articles are in French. This causes a certain discrepancy between the book's title and its contents - why not add "in France" or "in Europe" to the first part of the title? Such an addition would help to bridge the gap between this and publications with similar subject matter and titles, such as that by Eluere and G. Morteani. Some important aspects of gold's development are consequently inevitably missing from this book, *eg* those concerned with the Middle and Far East and South America. On the other hand we have in France today Western Europe's biggest gold mine (1) and it is therefore appropriate for the history of gold in France to be mainly in French even if gold often speaks English with a South African, Australian, or North American accent!

The reader will have no problem in understanding technical terms and expressions as there is a helpful 'Glossaire' (*ca* 250 entries) and a detailed 'Index géographique et ethnographique (10 pages)'. The book has seven sections: 'Geology and Handling of Ores' (6 contributions); 'Ethnic-Archaeological Comparisons' (2); 'Treatment of Minerals, Metallurgical Techniques' (5); 'Fabrication and Spreading of Jewellery' (7); 'Gold, its Economy and Symbolic Value in Celtic

Societies' (4); 'Production and Circulation of Monetary Gold' (3); 'Gold, its Economic and Symbolic Value in the Antique World' (4), and a final section entitled 'Conclusions'. In all there is a total of nearly 500 pages.

Naturally, the reviewer has a personal preference for certain chapters. In this case he particularly liked the first 200 pages on geology and mineralogy as well as those on antique mining. The latter include everything from excellent maps and photos of open pits and underground mines to ¹⁴C and tree ring analyses. Other European producers of gold are also indicated, even including the ill-fated mines of Rumania (Dakia).

Yes, a touchstone was found as well! - Was it the Celtic miner's equivalent of today's miners' portable X-ray fluorescence unit of the mines of the Transvaal, used to determine the gold concentration at the stope?

The title of the 'Treatment of Minerals, Metallurgical Techniques' section looks very promising to a metallurgist, but those who anticipate that secrets may be revealed will be disappointed. The Celts suffered the same problems as the South Africans do today: *ie* liberating the gold flakes from the pyrites/quartzite gangue (explained in the 'Glossaire') either by roasting or grinding. Crucible analyses list more than 25 elements (figures to four digits!), but omit phosphorus, which was often derived from added bone ash to provide heat resistance, as was graphite (*ie* carbon) which is also missing. Purification and alloying of gold for monetary purposes are discussed on a purely statistical basis - there is no mention of 'liquation' or the famous 'misy' of Plinius Naturalis Historiae. From famous Celtic Manching a new find of furnace pieces is reported - a furnace which could easily be adopted for other metallurgical uses! The paper has a nice paragraph on

the reducing and oxidizing conditions which can be created in such furnaces - evidence was obtained using Mössbauer analysis of the Fe(II) and Fe(III) compounds in the moulds.

Our French colleagues appear to suffer from the same problems experienced in other countries (*ie* insufficient interdisciplinary cooperation)? With advantage, they could have consulted today's metallurgical specialists before and after the ongoing excavations, in this case the head of CLA's gold refinery in France. On the other hand, it is likely that the Celts purified and modified their gold products in specialized centres, away from the mines.

At the end of the book the reviewer, a chemist, enjoyed the contributions on the economy and symbolism of gold in the Old World, and the discussion of the spread of gold from Athens and Rome to Gaul - providing a challenge to isotope and platinum metals daters. Undoubtedly, the quality treatment of these questions is better addressed here than anywhere else.

The production standards for the book are excellent: for example, the use of glossy paper, the top quality of the coloured illustrations, and the black and white diagrams are without flaws. The editing has been done efficiently, smoothing out the differences in the quality of the contributions. The price to be paid for all this is the delay of five years between the 1994 conference and the appearance of this book in 1999 - one had almost forgotten Limoges 1994! Overall, however, this publication provides a missing link in the history of the world's gold and makes interesting reading. The book is to be recommended not only to archeologists and historians but also to technical people interested in the origins of their trade - it should not be forgotten that many of the skills providing us with our present comfortable

life style originated from mankind's obsession with gold. Finally a riddle: What is the meaning of the French word 'Stockwerk': see the 'Glossaire', p 480 for the answer!

Christoph J Raub
Schwäbisch Gmünd

Reference

1 L.F Trueb, *Gold Bull.*, 1996, **29**, 137

Gold

by Richard Herrington, Chris Stanley and Robert Symes, The Natural History Museum, London, 1999, 64 pages, ISBN 0-565-09141-7, Price £7.95

This is a concise, stimulating account describing the features of gold and its long history. Many of the core scientific and technological features are highlighted in sections dealing with the properties, mineralogy, and extraction of this precious metal. Uses for gold are described in sections on ornaments and jewellery, and technology and medicine. Historical themes are dealt with in sections entitled 'Gold in Antiquity' and 'The Gold Rushes'. Then there are sections on 'Gold Mining and the Environment' and 'Gold as a Commodity'. The total world gold production to date is estimated to be 125,000 tonnes of metal and today a total of 2,500 tonnes is produced annually in 50 countries

The section on 'Goldsmiths, Hallmarks and Assaying' indicates that gold has been cast since *ca* 3000 BC and was important to the Ancient Egyptians, Romans and Greeks. The Goldsmiths' Company received its Royal Charter and in 1478 it was decreed that goldsmiths and silversmiths should take their wares to the Goldsmiths' Hall to be 'hallmarked' for purity and this practice has continued virtually unchanged until today.

Currently the principal use of gold is in ornamentation and jewellery and there are smaller but significant uses in the electronics, dental and medical spheres and potential in catalysis.

The reader new to the field could readily find information on many of the key features of gold, using the glossary and index. There is also a section on further reading. There are many attractive and colourful illustrations and overall this elegant little book should serve as a useful educational aid to introduce the subject of gold to anyone interested.

David Thompson

Gilded in Fire : History and Technology of Fire Gilding and Amalgam Silvering

'Im Feuer Vergoldet. Geschichte und Technik der Feuervergoldung und der Amalgamversilberung' (in German), by Kilian Anheuser, Volume 4 of the AdR Series on Restoration and Excavation Techniques, edited by Arbeitsgemeinschaft der Restauratoren, Museen-Denkmalpflege - Grabungstechnik eV, Konrad Thesis Verlag, Stuttgart, 64 pages, ISBN 3-8062-1404-2, Price DM 39.80.

Author

Kilian Anheuser studied chemistry and the history of art in Bonn. He carried out research for his doctorate with Peter Northover in Oxford on fire-gilding and amalgam silvering. He is now a lecturer in conservation science at the University of Cardiff.

Contents

The most artistic gold coating technology for metals from late antiquity to the 19th century was fire- or amalgam-gilding. The metallic object to be coated, made from copper, brass, bronze or silver, was

covered with a gold-mercury paste (amalgam), heated to volatilize the mercury and finally polished. Iron could be gilded only indirectly.

Today this method has been replaced by other gold coating techniques and most of the knowledge of the practical details has been lost. The book combines results of studies of written historical sources on fire gilding with a discussion of the scientific basis and reconstruction experiments. The microscopic and analytical methods available today enable a clear-cut definition of this method. The author introduces and compares examples of different times and cultures, from Chinese belt-hooks of the 3rd century BC up to French furniture fittings of the 18th century. The little known amalgam silvering is treated in the same way.

This interdisciplinary monograph based on the most recent state of science is directed towards the art restorer as well as the interested art historian, archaeologist, chemist, physicist and metallurgist, and arts and crafts specialist.

**(Translated from the book
by Ch J Raub)**