

Other more recent steam-powered brass-rolling plant from the same site is installed at the Musée de l'Industrie further to the south-west at Charlroi on the River Sambre. This museum was inaugurated in September 1988, also in premises made available from redundant buildings of the Cockerill Sambre company. Here, it is intended to establish a centre for the industrial archaeology of this heavily industrialised area along the Sambre.

Further to the East, the former mining and zinc-smelting town of Kelmis lies in the German-speaking area five miles west of Aachen. This small border community, known as La Calamine in its French version, has now opened its local museum concentrating mainly on the history of the industry on which the town was founded. The material collections and research which made the museum possible were very largely assembled over the years by local historian Firmin Pauquet. Using the extensive records made available by the Vieille Montagne company and other sources, very worthwhile results have been achieved.

Joan Day

Book reviews

Graham Philip, *Metal Weapons of the Early and Middle Bronze Ages in Syria-Palestine, Parts i and ii*. BAR International series 526, Oxford, 1989.

The appearance of an updated version of Graham Philip's PhD thesis *Metal Weapons of the Early and Middle Bronze Ages in the Levant* can be welcomed as an essential tool for future research in this field and as a guide to the increasing mass of material yielded by excavations in Syria and Palestine. All unprovenanced items are excluded and a preferred nomenclature for the Early and Middle Bronze ages clearly defined to assist those who may prefer to think in centuries rather than periods whose limits may vary in different geographical areas. But how does one use these volumes? First, ten pages of no-doubt well-deserved criticisms of earlier studies of Near Eastern weapons referring to books and articles dating from 1917 (Petrie) to 1977 (Erkanel) are followed by another long section "Typology: a consideration"

devoted almost entirely to the definition and use of the terms 'type' and 'style', with a discussion of the use of these terms by earlier writers. But have archaeologists in fact 'often talked in terms of "typological change as if it were a process with an internal dynamic of its own"', and how many scholars have actually used metal types alone as a means of constructing chronological sequences? Moreover, Philip's clear statement that 'types may survive in use over a long period, even quite elaborate types if they are deemed particularly appropriate for some purpose' is axiomatic and well appreciated by anyone who possesses a garden tool-shed as well as those concerned with ancient metallurgy. The fact that technological improvements used in one area are not necessarily contemporary with comparable advance in another has been accepted for many decades. Few scholars would therefore endorse the 'classic typology technology-chronology framework' for which Philip devotes much detailed criticism. But certainly it is necessary to stress that the period of use of any distinctive metal object, even when found in a well stratified context or in a burial with or without tablets, inscriptions or associated objects, can never be exactly defined beyond the date when it was deposited.

In this connection one looks in vain (either in the text or bibliography) for any mention of the well-known axehead from Chagar Bazar with decorated shafthole which should be considered, along with two comparable examples, one in the British Museum and the other in Baghdad. The latter is especially noteworthy in that it provides evidence of a date, after 1800 BC for its use. The inscription along the base of the blade mentions the Babylonian king Rim-Sin with the divine determinative which we know was used only after the twenty-second year of his reign. (*Iraq* 1952, 118, pl.31).

The third section of Part i is devoted, after the general survey of the material, to general comments and some useful discussion and conclusions about the material based on cultural and archaeological data. Here welcome attention is given to textual evidence from Ebla and Mari and to important work such as Heather Lechtman's studies of Andean metallurgy. But while the use of a relational data base combined with statistical techniques has no doubt simplified the task of the author it assumes that all the potential readers are at least familiar with computer language and methodology. A computer can sort material, but it cannot tell one how an object was made or how it was used. The lack of attention given to problems of technology is therefore surprising. Detailed technological studies are particularly valuable in any study of metal objects in this field and the development of archaeo-metallurgical University departments and the involvement of working metalsmiths is happily increasing today.

The section on Method includes headings 'Categorical variables', 'analytical methods' and 'classifications procedures' to elucidate the author's stated

'multivariate approach' in order to deal with 'polythetic types'. This seems complicated to a degree beyond the comprehension of the normal archaeologist and could have been severely cut. Useful sections on foreign parallels could then have been expanded. Finally, we can be grateful for the comprehensive chemical analyses, the distribution maps and catalogues and the inclusion of stimulating ideas in the section 'the wider perspective'. The assessment of the evidence of weapons set against the archaeological record for the 3rd and 2nd millennia in Syria and Palestine is clear and useful and there is a balanced discussion of the 'porteurs de torcs' problem. But a future edition must have an index, more illustrations to the catalogues, editing to avoid repetition, place names on the distribution maps and cross-references between illustrations and text.

K R Maxwell-Hyslop

Diana S Waite, **Ornamental ironwork — Two centuries of craftsmanship in Albany and Troy, New York**. pp144 8½" × 11" Mount Ida Press, 4 Central Avenue, Albany, NY 12210.

Albany and Troy, New York, were pre-eminent ironmaking cities of 19th century America. Cast iron stoves, known world wide for innovative designs and high quality casting, millions of iron horseshoes, and miles of railroad rails, flooded from these ironworks across the United States.

Today we can see in the wealth of local wrought and cast ironwork, the legacy of these firms. In the apt words of Mrs Waite, "Architectural ironwork in Albany and Troy, along with examples in nearby Watervliet, Cohoes, and Green Island, stands today much like a large collection of public sculpture, freely available for examination and enjoyment by all passers-by."

The oldest wrought ironwork dates from the earliest years of the 19th century, Row (Terrace) houses with elegant stoop rails, balconies and iron fences. We hear of blacksmiths and founders — Amos Fish, financially successful and personally eccentric; Simon Cunliffe Jun. who specialized in cast iron fences, as did Carls, Hartman, and Hoffman; of Daniel Badger, and intriguingly to H.M.S. members, of Daniel Doncaster & Son.

Much of the wrought iron is surprisingly elaborate with cast balls worked into the designs; while some extraordinarily large and magnificent wrought iron basket urns on newel posts are very unusual. Diana Waite traces how, as in England, wrought iron gave way, around the middle of the century, to the cheaper and easily mass produced cast iron. Surprisingly, however, there was an important revival of architectural wrought ironwork in Albany and Troy in the 1870s, through to the end of the century, which appears to have been a good deal more lively,

inventive, and of greater extent, than was evident in this country at the time.

Diana Waite, devotes an interesting section to prefabricated cast iron facades and buildings. While local firms had been perfecting the casting of fences, railing, and smaller prefabricated elements, the firms of James Bogardus and Daniel Badger in New York had come to specialize in cast iron buildings. They had the advantage of being fireproof, quick to erect, and that they could be prefabricated in factories during the hard winters. When in 1857 Major Alfred Mordecai took over the command of the U.S. Army's arsenal in Watervliet, just across the river from Troy, he contracted Badger's foundry to build "an iron warehouse for storing gun carriages". This cast iron building, of a simple and elegant design, slightly classical in appearance, still exists today. 100ft wide, and almost twice as long; it is thought to be the only all iron building in America, still used for its original purpose. James McKinney and Daniel Doncaster were Albany firms who produced cast iron facades.

Diana S Waite has produced an excellently researched and beautifully produced book. Her architect husband has contributed a chapter on how to preserve and restore ironwork, and the book concludes with a guided walking tour of Albany and Troy architectural ironwork. \$19.95. English price £12.50 + p&p £1 from BABA Peter King, Rosebank, Plaxtol, Sevenoaks, Kent. TN 15 0QL. or from V&A shop or R.I.B.A. shop.

Amina Chatwin

Bertel Tingström, **Plate Money, The World's Largest Currency, The Royal Coin Cabinet, Stockholm, 1987?**. 300 × 220 mm, 344 pages. ISBN 91-7192-674-7.

Profusely illustrated with photographs (12 in colour), distribution maps, graphs and tables.

This beautifully produced and generously set definitive work will be welcomed as a long overdue introduction in English of a unique episode in Europe to an international public. Essentially a numismatic document with a penetrating analysis of the relevant metallurgical and social history meticulously arranged and presented in a refreshingly direct manner, its undoubted value is great enhanced by the many fascinating sidelights revealed more indirectly and almost unconsciously. One cannot resist quoting from p. 62: 'The instability in decisions on permits and bans on exports [of copper] was also significant, suggesting that the decisions of the Government were reached more on impulse than as a result of a carefully prepared policy.'

Perhaps especially welcome, although now not uncommon, is the fully described and comprehensively utilised computer analysis of the basic data of the Inventory assembled between 1979

and 1983 (Chapter 6). On the basis of nearly 11,000 extant plates, mainly in Sweden and Finland, a number of far-reaching conclusions are drawn about production, circulation and proportions of denominations, and related to the documentary evidence. In that context the discussions are of considerable general importance since they provide an unusually well-suited and thoroughly developed example of the pattern of interplay between archive and archaeology.

But most pleasing to the reviewer, and probably to many others, is the happy decision to make a whole third of the book, not counting the many other visual contributions, into a photographic catalogue of all the stamps on plate money. Apart from the purely sensuous, almost tangible, pleasure afforded to a rabid coin fancier, such a catalogue turns study and comparison from drudgery to sheer delight because it does away with all those totally unnecessary words of subjective description. Please let's have more catalogues like this one!

What is, in effect, a history of Falun and Avesta, the principal mining and processing centres, respectively, and of the route from mine to mint is concentrated in the first two chapters. During the period involved 1624–1776, Sweden was in no fewer than 8 wars with her neighbours around the Baltic, not counting a 'state of almost permanent war from 1621 until 1648.' The effects of these disturbances were marked, and are clearly brought out. However, they are overshadowed by the constant changes in the political situation which seems to have pursued a course of its own. It is the interaction between state, people and money that throws some of the most fascinating sidelights on this tale.

Obviously the most interesting and informative part of the book for HMS readers will reside in the section dealing with the processing of the metal, and particularly with the mechanical equipment used in striking. The numerous 'engineering drawings' of machines and 'activity sketches' of working mines, dating from 1635 to 1715, invite favourable comparison with Agricola and Diderot.

One of the largest chapters considers in great detail the archaeological background of all the known finds of plate money in Sweden and Finland. Another presents an equally meticulous analysis of the actual surviving material with special reference to striking technique, engraving, weight, value, cutting and special treatments, counter-stamping and other peculiarities. Shorter sections deal with standard weights and sizes, and successive modifications of stamps.

Finally there is a review of the plate money era, followed by 13 appendices of detailed information on specifications and regulations, production, denominations and periods of issue, as well as special aspects of minting and purchasing power. There are a few short single pages which need to be consulted

before any serious reading begins, and referred to in the course of it: particularly pages 239 and 240 which unveil the mysteries of Swedish weights and, most necessarily, of the 'double standard' (is that where the modern expression arose?) used to deal with coinage and 'units of account' quite separately and, ultimately, in constantly changing relationship due to successive devaluations and other adjustments. Not to mention the silver *riskdaler* and gold *ducat*, the post-medieval EMUnits!

English readers may be puzzled at first by the odd use of some technical and specialist terms; but no matter: the meaning is clear enough once such differences and the actual nature of material or process are recognised, though it would be helpful if the next edition had its metallurgical terminology checked. One cannot help smiling at the delightfully ridiculous circumstances in which people in all seriousness find themselves carrying their loose change strapped to their backs, or unable to make their getaway since they could not lift their loot 'higher than to their knees'.

Though highly specialised this book is clearly a collector's piece in a great many respects beyond its immediate core subject because it contains a wealth of valuable peripheral information not easily available to UK readers in any other place or form. This becomes particularly significant in a wider context when we remember that during the first half of the 17th century the Falun mine supplied two thirds of Europe's copper. Whatever concentration it may require from us, according to our personal interest, no-one could put this book down without a powerful impression of the size and weight of this, in its setting, quite incredible currency – and yet also of the simplicity, efficiency and even elegance of the beautifully drawn manually operated striking machine of 1714 'with a capacity of 500 plates per hour' (p. 97).

Leo Biek

Peter and Susan Crew (Editors), **Early Mining in the British Isles**: Proceedings of the Early Mining Workshop at Plas Tan y Bwlch, Snowdonia National Park Study Centre, 17–19 November 1989. A4 paperback, iv + 80 pp. ISBN 0 9512373 7 3. Published 1990 by, and available from, Plas Tan y Bwlch, Snowdonia National Park Study Centre, Maentwrog, Blaenau Ffestiniog, Gwynedd. LL41 3YU (£10 including UK postage – cheques payable to Gwynedd County Council).

Less than a decade ago the publication by Jackson of several articles drawing attention to Bronze Age copper mining at Mount Gabriel drew forth a furious ripost by C. S. Briggs in his 'Bronze Age bonanza or post-famine fiasco' article. Claims for Bronze Age mining at Alderley Edge, and at Cwmystwyth, and at Llandudno fared little better. Despite growing

evidence from abroad, and Oliver Davies work in the 1930s, or perhaps in reaction to it, since he tended to describe everything ancient as 'Roman', it had become almost axiomatic that the intensity of later working in Britain had obliterated all traces of ancient exploitation. Further it was 'obvious' that ancient mining would only have bothered with rich and especially oxidised ores in places where they could easily be found. The recent work summarised in this volume tells a different story.

The contributions come under several headings: archaeological survey and excavation results, notably at Mount Gabriel in County Cork, and at the Great Orme, Parys Mountain, Nantyreira, and Cwmystwyth, in Wales; reviews and experiments of firesetting and stone hammer technology, and of smelting of copper ores; listings and discussion of calibrated radiocarbon dates and their application in early mining; and some general discussion of the extent and difficulties of ancient mining in Wales. Finally, and included a little uneasily in view of the title, there is a description of an early mining site in the Mitterburg Region of Austria, and an evocative picture on the front cover of 'modern' gold mining at Serra Pelada in Brazil. It is invidious to pick out heroes in all this, but the persistence of Dr. J. S. Jackson in Ireland, of Duncan James at the Great Orme, and Simon Timberlake at Cwmystwyth deserve special mention, as does that *eminence gris*, Dr. Paul Craddock. As other contributions show, ancient mining has now attracted the attention of professional archaeologists, and much more information will emerge in the next few years.

From the reports included, it is quite clear that there is abundant evidence for ancient mining in Britain. It is now being generally concluded that stone hammers, at least when found in a mining as opposed to an ore-dressing context, are a good indicator of pre-Roman working (who would use stone once iron was widely available?). There are a score of such sites in mid-Wales alone. Stone hammers and antler-picks with

fire-setting provide an adequate technology for tackling both soft and hard rock, to considerable depths. Low grade ores of copper, oxidised and probably pyritic too, were exploited, but as yet there is little known of tin and lead/silver extraction.

The major contributor in all this is the scientific back-up which is now available. Radiocarbon methods are now approaching a level of precision to enable the time-development of an area to be deduced, whilst palaeoecological work helps determine the wider anthropogenic activity. There are indications that iron in copper artefacts may enable identification of primitive smelting of copper or otherwise. Arsenic levels may help explain the (so far) absence of ancient copper slags in Britain. Somewhat more sophisticated experiments than those so far described for firesetting will be necessary for really useful information to emerge, but a start has been made, and no-one who saw the experimental firesetting will have any doubts as to its efficaciousness.

In producing to a low budget, the editors have done surprisingly well, aided no doubt by use of a computer before photo-typesetting. Drawings are generally well done, with a particularly fine illustration of the workings at Great Orme, and very detailed sections of the tips at Copa Hill. Photographs are generally of a passable quality. The text is, to my middle-aged eyes, perhaps a little small (9/10 point Bembo, double column), but is readable and it has enabled roughly the equivalent of two of the more substantial issues of *Historical Metallurgy* to be put on only 80 pages. Congratulations to them – similar techniques would allow more full reporting of conferences – and, as in this case, within six months too.

This is an important, and we must hope, only an interim report of some of the most exciting developments in mining and metallurgy in recent years. My advice – buy.

Lynn Willies